SunWiz PV Sales Tool User Manual

Calculating and Communicating PV's Financial Outcomes to Staff and Customers

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1 Introduction

The *SunWiz PV Sales Tool* is intended to assist in the evaluation of the financial outcome resulting from installation of a solar power system. It contains many graphs, tables, and charts that can assist in conveying a sales message. It is intended for in-house use in solar power companies, but can easily be extended, in recognition that most users of the tool wish to customize their own sales message.

There are restrictions placed upon fields that can be manipulated. This is done in order to protect the novice user from inadvertently changing a cell containing an automatically-updating formula upon which calculations depend. Cells that are user-modifiable are highlighted in yellow. Expert users wishing to customize the spreadsheet may request a password that unlocks all cells. Alternatively, an automatically-updating spreadsheet can be added that references cells within the supplied workbook.

This user guide accompanies the MS Excel workbook. It consists of three parts:

1. An introduction to the features of the workbook, and an overview of the spreadsheets.
2. A step-by-step guide for beginners to operate the workbook.
3. Description of the major outputs from the spreadsheet, and their value in a sales pitch.

In addition, guidance is contained in comments within the spreadsheet, and in the “how to use” tab at the start of the workbook.

Some familiarity with MS Excel is assumed. For those less-familiar with the operation of MS Excel, a bar exists at the bottom of the Excel program (see image below) that allows users to switch between spreadsheets (also referred to as “tabs”) in the workbook. As more tabs exist than can be displayed on screen at once, use the arrows on the left (< and >) to scroll the tabs left and right. To change tab, simply click on the desired spreadsheet name across the bottom of the page.

Use the horizontal and vertical scroll bars to move around a single spreadsheet, and use the zoom to enlarge the numbers on screen (see image below)

2 Workbook Features

The *SunWiz PV Sales Tool* is designed to simplify the process of financial evaluation of a PV system under a range of circumstances. It contains many complex formulae to calculate revenue, payback, internal rate of return ("effective interest rate"), and cash flow. This ensures that solar businesses can spend their time selling and installing, backed by a tool that accurately performs the calculations they need to convince customers to purchase from them.

The *SunWiz PV Sales Tool* contains:

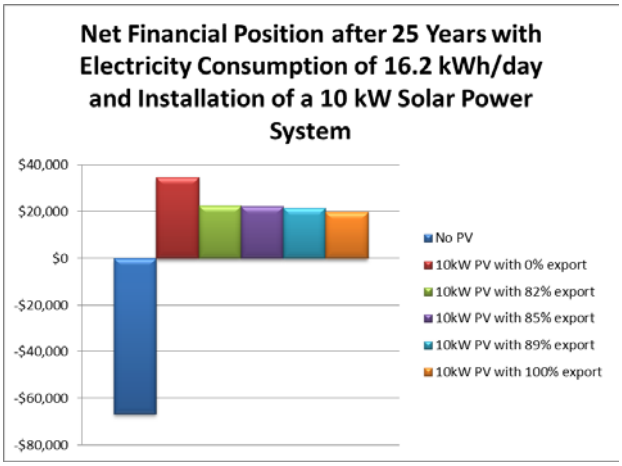
- User-controllable:
  - solar power system performance inputs,
  - state of Australia,
  - REC (renewable energy certificate) price,
  - REC multiplier,
  - REC zone,
  - year of analysis,
  - grid electricity price and annual increase,
  - annual panel degradation, and
  - premium price above Feed-in Tariff (FiT, also known as a "solar bonus scheme" in some states).
- Automatically calculated:
  - number of RECs,
  - net or gross FiT, and
  - remaining duration of Feed-in Tariff.
  - Comparison of 6 solar power systems, with user-controllable solar power system prices.
  - Automatically calculated post-REC system customer prices.
  - Automatically calculated annual revenue and simple payback.
  - User-controllable range of (net FiT) export power percentage to help solar businesses understand the sensitivity of payback to export.

The *SunWiz PV Sales Tool* provides these handy sales tools:

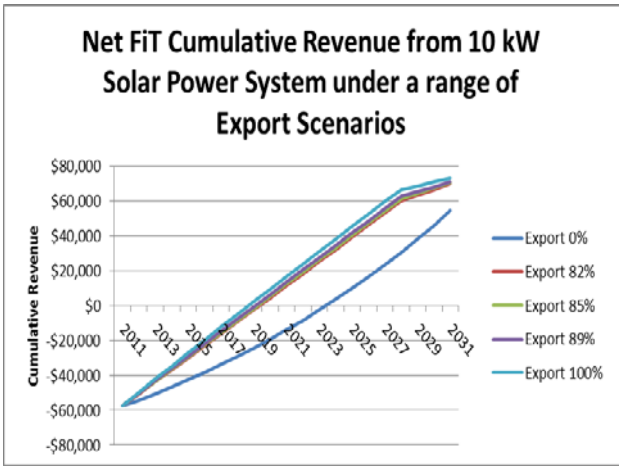
- Calculation of the likely amount of solar power export by each of the selected systems, and the consequent payback, displayed as a table and in chart form.
- Quantifiable demonstration that larger solar power systems typically have quicker payback, and demonstration of the benefit of saving daytime electricity consumption.
- Detailed financial investigation of one of the six chosen solar power system sizes, including post GST price, post-tax cost, 20 year depreciation calculation, simple payback, and internal rate of return.
- Charts of customer price net of solar credits, payback and IRR vs. export power percentage.
- Cash flow calculation and charts for various electricity consumption levels with and without loans.
- A customer summary sheet, useful for printing

3 How to use the tool to enhance your sales pitch.

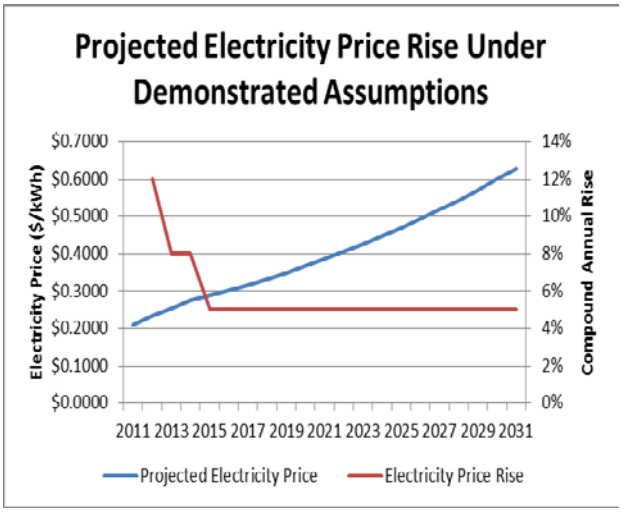
Let's face it; most of the population doesn't understand complex graphs. They simply want to be reassured that they're making a good decision. This tool will assist you in convincing your customers that they're making a good decision[1] to purchase a solar power system. Carefully used, it can also assist you to highlight why your system is better than your competitors' systems, and to protect you from making a claim your customer may later sue you for.



This tool produces a number of easy to understand graphs. Bar charts compare financial outcome after 20 years (No PV = bad, PV = good). They also show cash flow taking into account electricity bills (No PV = graph going down = bad; PV = graph going up = good). They show electricity price increases (always bad), and what impact it might have on annual and cumulative electricity bills without a PV system (curves go down → bad again). They can also be used to up-sell a solar power system.



At the very least, this tool answers the question "What is the payback on my system?" But while simple payback is a simple concept to understand, it doesn't tell the whole story. Simple payback is just the first year cost divided by the first year revenue. But if the electricity price rises in the first few years, then the true payback could be far sooner. Conversely, if a system fails the month after it has paid for itself, it wasn't a very profitable investment. This tool calculates simple payback, true payback, and the return on investment.



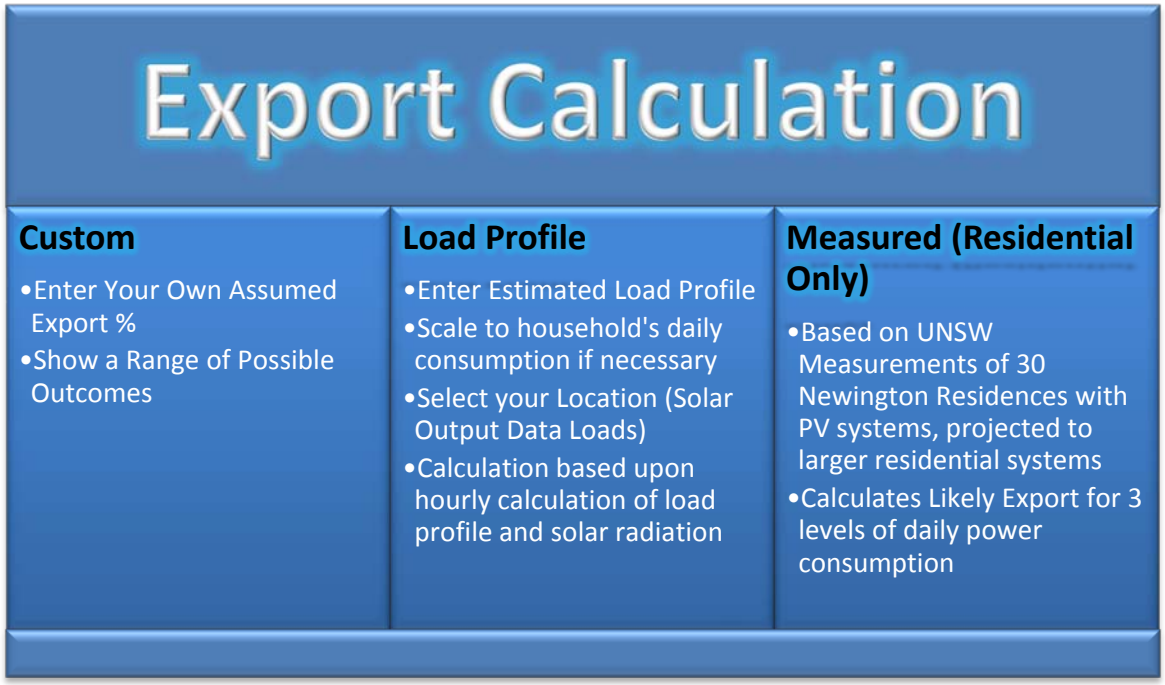
[1] Or not, as the case may be

The return on investment is expressed in terms of Internal Rate of Return (IRR). While this can be complex to understand and convey, put simply it's the "effective interest rate on your investment". If the IRR is greater than the interest rate a bank will give you on a bond, then it could be considered a sensible financial investment (depending on the risk involved in the investment).

Solar power could be considered a risky investment in states with net Feed-in Tariffs, as the revenue can vary by a factor of three depending on a site's daytime power consumption. Fortunately, this tool substantially reduces this risk by calculating the likely amount of generated power that is export, and thus the corresponding likely revenue, likely simple payback, likely true payback, and likely IRR. Of course, a model is only as good as its assumptions and inputs, so use this tool wisely.

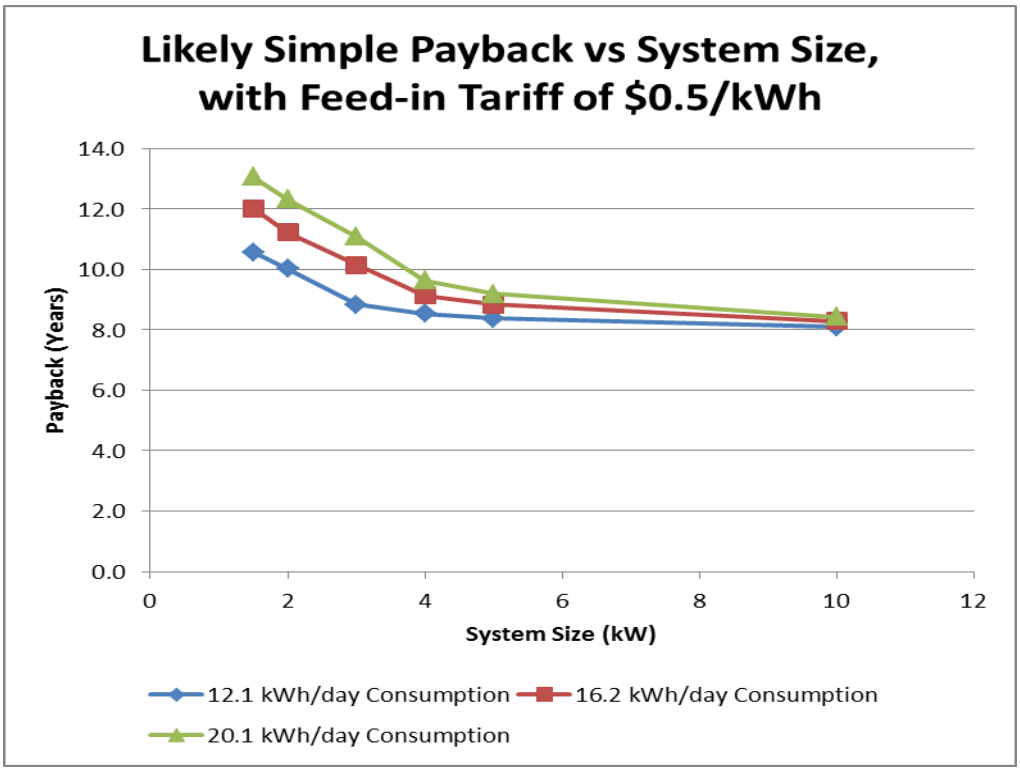
3.1 Export Calculation

For those selling in states with net Feed-in Tariffs, a correct calculation of the amount of power that is exported is essential to your payback calculations. Exports can be calculated in one of three ways, as illustrated below. The 'Measured' method is the simplest and most accurate to use, if you have a residential customer with daily power consumption between 12 and 21 kWh/day. If not, you can enter an hourly load profile for each month of the year, from which a synthesized load is created for each hour of the year, and compared to predicted solar generation in your selected nearest capital city (other locations available too). Otherwise, use Custom to provide your best estimate, and a sensible range.

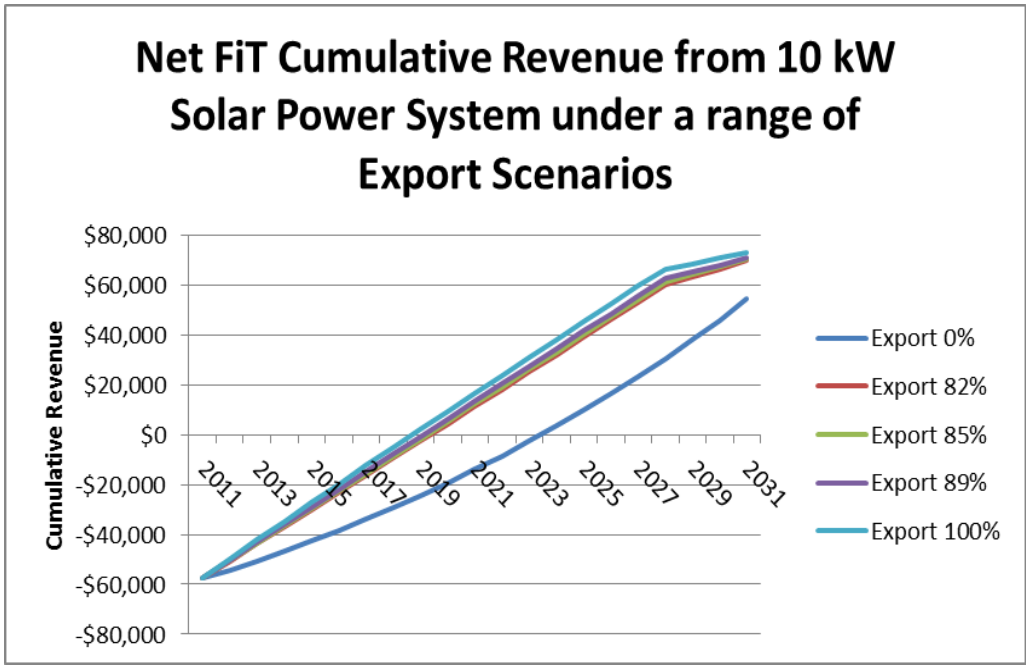

Export Calculation
Custom
•Enter Your Own Assumed Export %
•Show a Range of Possible Outcomes
Load Profile
•Enter Estimated Load Profile
•Scale to household's daily consumption if necessary
•Select your Location (Solar Output Data Loads)
•Calculation based upon hourly calculation of load profile and solar radiation
Measured (Residential Only)
•Based on UNSW Measurements of 30 Newington Residences with PV systems, projected to larger residential systems
•Calculates Likely Export for 3 levels of daily power consumption

3.2 Multi-System Analysis

The tool allows you to enter six system sizes, prices, and performances. All six are shown for comparison purposes for the Measured Export Calculation.



Otherwise all the graphs reflect the chosen system size for deeper analysis.



4 Overview of Spread sheets.

Spreadsheet	Inputs	Outputs	Value
Inputs	Government support and performance-relevant inputs that apply to the whole workbook.	Export Percentages.	
Revenue and simple payback	A range of six system sizes and corresponding prices. A range of percentages of export power to investigate under a net Feed-in Tariff. A range of REC prices.	Customer Price pre- and post-RECs. Annual Revenue. Simple Payback.	Quick assessment of the impact of system price and performance on revenue and payback. REC price sensitivity analysis.
Tax Analysis	A single system size to be financially analysed in greater depth. Refers to "Inputs" tab.	Price breakdown for residential and commercial customers. Pre-tax and post-tax revenue, more accurate payback for residential and commercial customers, and Internal Rate of Return ("effective interest rate") that takes into account rising cost of electricity.	Provide customers with a tailored payback calculation. Demonstrate the large discount on commercial systems due to the combination of GST, RECs, and depreciation. Convince commercial customers with investment decisions based upon IRR hurdle rates.
Customer Output - Residential	Customer Details	Linked summary of data within spread sheet.	Displays snapshot of analysis for a residential customer, along with summary of relevant graphs.
Customer Output Commercial	Customer Details	Linked summary of data within spread sheet.	Displays snapshot of analysis for a commercial customer (taking Depreciation into account), along with summary of relevant graphs.
Likely Net FiT payback	As specified in "Inputs" tab.	For net FiTs, the likely amount of generated power that is exported for the selected range of system sizes, based upon electricity consumption, and consequent simple payback.	Provide customers with a more-accurate and realistic estimate of their revenue and payback that is based upon industry measurements.
Likely Gross FiT payback	As specified in "Inputs" tab.	Simple payback for gross FiTs.	A quick analysis of simple payback under FiT.
DCF Analysis	As specified in "Inputs" tab.	Discounted cash flow over 20 years. The details that lay behind the "Tax Analysis" IRR calculations.	
Depreciation Schedule.	As specified in "Inputs" tab.	Depreciation analysis for system that is selected on "Inputs" tab.	

Spreadsheet	Inputs	Outputs	Value
Cashflow	Annual electricity consumption, loan amount, loan term, and interest rate.	Annual and cumulative flow of cash based upon customer's electricity bill and solar generation with various export percentages, with and without a loan, for the system chosen in "Inputs" tab.	Demonstrate the insulation provided by a PV system from rising electricity prices, and possible profitability.
Projected Electricity Price	As specified in "Inputs" tab.	Graphs the increasing costs of electricity against the steady costs of the PV system.	Shows the expected rise in electricity prices over 20 years, against the steady price of a PV system.
Price Breakdown	As specified in "Inputs" tab.	Graph of the effective price paid by commercial customers after GST, RECs, and depreciation is accounted for.	Visually convince commercial customers of the savings they receive.
Net FiT Payback and IRR	As specified in "Inputs" tab.	Graph of commercial and residential payback, and commercial IRR incorporating rising cost of electricity and panel degradation, as they vary with export power percentage.	Demonstrate to commercial customers that good benefits are available, and even greater benefits are within reach if they export more power. Relevant to Net FiT only.
Gross FiT payback IRR Chart	As specified in "Inputs" tab.	Bar chart of commercial and residential payback, and commercial IRR incorporating rising cost of electricity and panel degradation.	Demonstrate the favourable outcomes available under a gross FiT.
Likely Net FiT Payback Chart	As specified in "Inputs" tab.	Graph of the likely payback from a range of system sizes, under three levels of annual power consumption.	Provide customers with a more-accurate and realistic estimate of their revenue and payback that is based upon industry measurements. Visually demonstrate the value of investing in a larger system, and of saving daytime energy use. Relevant to Net FiT only.
Gross Fit Payback Chart	As specified in "Inputs" tab.	Graph of the likely payback from a range of system sizes.	Visually demonstrate paybacks under Gross FiT.
Net Fit Solar Revenue	As specified in "Inputs" tab.	Graph showing annual revenue over 20y period for the selected system size, using a variety of export values.	Shows how much revenue a system can produce annually over a 20 year period.
Gross FiT Solar Revenue	As specified in "Inputs" tab.	Graph showing Revenue on the selected system size if export was 100%	Shows maximum amount of revenue a system can produce annually over 20 year period.
Net FiT Cumulative Revenue	As specified in "Inputs" tab.	Graph showing revenue accumulated over a 20 year period, for the selected system	Shows how much accumulated revenue a system can produce over a 20 year period.

Spreadsheet	Inputs	Outputs	Value
		size, using a variety of export values.	
Gross FiT cumulative Revenue	As specified in "Inputs" tab.	Graph showing accumulated Revenue on the selected system size if export was 100%.	Shows maximum amount of accumulated revenue a system can produce over 20 year period.
Net Financial position nFit		Bar Graph of possible Saving incurred over a 20 year period, with varying export amounts on the chosen system size.	Demonstrates savings on electricity.
Net Financial position qFiT		Bar Graph of possible Saving incurred over a 20 year period, with a 100% export on the chosen system size.	Demonstrates savings on electricity.
Net Position - Self funded	none	Graph of the cumulative cash flow cash based upon customer's electricity bill and solar generation with various export percentages, assuming customer pays cost upfront.	Visually demonstrate cumulative electricity spent over 20 years, and comparative profit if a PV system is purchased.
Annual Cash Flow - self funded	None	Graph of the annual cash flow based upon customer's electricity bill and solar generation with various export percentages.	Visually demonstrate annual electricity spent over 20 years, and comparative profit with a PV system.
Net position - with loan	None	Graph of the cumulative cash flow cash based upon customer's electricity bill and solar generation with various export percentages, assuming customer takes a loan.	Visually demonstrate cumulative electricity spent over 20 years, and comparative profit if a PV system is purchased via loan.
Annual Cash Flow – with loan	None	Graph of the annual cash flow based upon customer's electricity bill and solar generation with various export percentages, assuming customer takes a loan.	Visually demonstrate annual electricity spent over 20 years, and comparative profit if a PV system is purchased via loan.
1kW solar Output	Location, load Profile.	Calculates hourly energy generation for a 1kW system, includes state variables.	Hourly system performance.
Net FiT output graph	Day of year, generated from 1kW solar output tab.	Energy consumption and export using a 1.5 kW system, for each day of the year.	Daily system performance.
RECs Zone, Fits, Exports.	Location, load profile for each system size.	Cash outcomes comparing system sizes and REC zones.	REC's received over the year.

5 Step-by-step Operation and Interpretation

Note that all input fields are marked in yellow

5.1 Inputs Tab –

	A	B	C	D	E	F	G	H	I
1	**SYSTEM SIZES TO BE ANALYSED**								
2	Selected Capacity (kW)		10						
3	Range of System Capacities (kW)		1.5	2	3	4	5	10	kWp
4	Deem RECs (STCs)?		TRUE						
5	RECs for Selected System		269						
6									
7	**SYSTEM PERFORMANCE**								
8	System Size		1.5	2	3	4	5	10	kWp
9	Optimal System Performance		2,272	3,030	4,544	6,059	7,574	15,148	kWh/year
10	Performance Adjusted for Azimuth,Shade		2,272	3,030	4,544	6,059	7,574	15,148	kWh/year
11	Equivalent to kWh/day		6.23	8.30	12.45	16.60	20.75	41.50	kWh/day
12	Annual Degradation		0.50%						
13	Nearest Location	Brisbane							
14	Panel Inclination (degrees tilt)	30							
15	Panel Orientation (degress E of N)	0							
16	% loss due to shading	0.0%							
17	% of optimal Yield	100%							
18									
19	**SYSTEM PRICE**								
20	System Size		1.5	2	3	4	5	10	
21	System Price Pre RECs excl GST		$9,000.00	$12,000.00	$18,000.00	$24,000.00	$30,000.00	$60,000.00	
22	GST		$900.00	$1,200.00	$1,800.00	$2,400.00	$3,000.00	$6,000.00	
23	Pre REC Customer Price incl GST		$9,900.00	$13,200.00	$19,800.00	$26,400.00	$33,000.00	$66,000.00	
24	Equivalent $/W		$6.60	$6.60	$6.60	$6.60	$6.60	$6.60	
25	RECs		93	103	124	145	165	269	
26	REC Discount		-$2,976.00	-$3,296.00	-$3,968.00	-$4,640.00	-$5,280.00	-$8,608.00	
27	Further Discounts		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
28	Additional Costs		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
29	Customer Price incl GST		$6,924.00	$9,904.00	$15,832.00	$21,760.00	$27,720.00	$57,392.00	

Step 1 – System Sizes to be Analysed

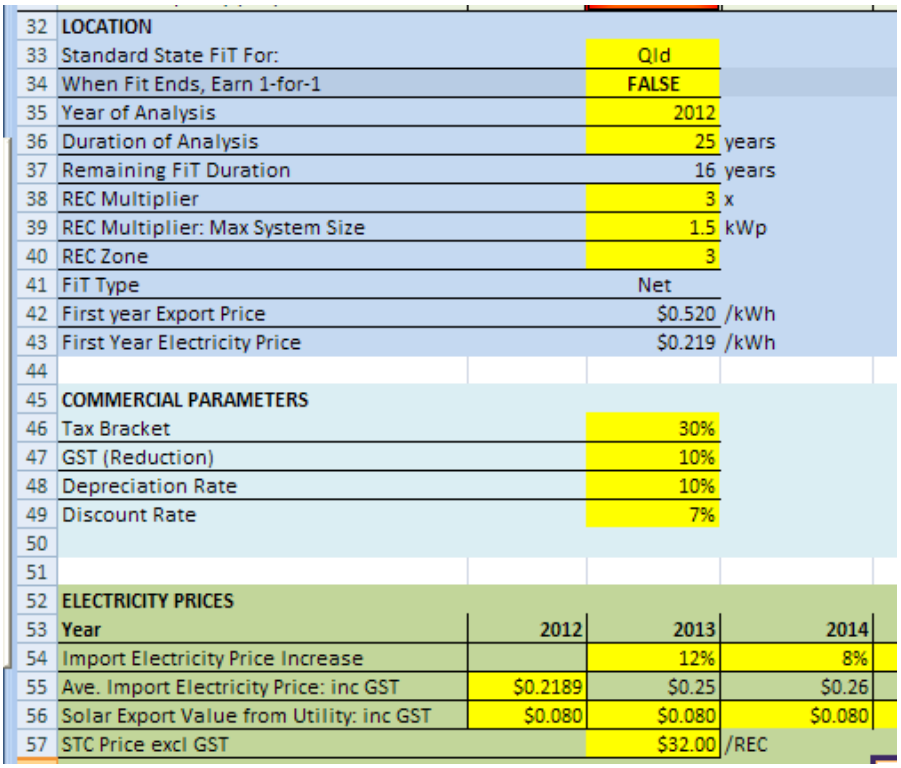
1. Use the drop-down arrow to select the size of the system to be analysed in detail from the range of system sizes below.
2. Enter a Range of up to 6 system capacities to demonstrate to your client.

Step 2 – System Performance

3. Enter the predicted actual performance (If the system is shaded, non-north facing, or flat pitched, adjust the performance here accordingly).
4. Enter the annual degradation of the system here, 0.5% is standard.

Step 3 – System Price

5. Enter the price of the system here, excluding GST.



32	**LOCATION**			
33	Standard State FiT For:		Qld	
34	When Fit Ends, Earn 1-for-1		FALSE	
35	Year of Analysis		2012	
36	Duration of Analysis		25	years
37	Remaining FiT Duration		16	years
38	REC Multiplier		3	x
39	REC Multiplier: Max System Size		1.5	kWp
40	REC Zone		3	
41	FiT Type		Net	
42	First year Export Price		$0.520	/kWh
43	First Year Electricity Price		$0.219	/kWh
44				
45	**COMMERCIAL PARAMETERS**			
46	Tax Bracket		30%	
47	GST (Reduction)		10%	
48	Depreciation Rate		10%	
49	Discount Rate		7%	
50				
51				
52	**ELECTRICITY PRICES**			
53	**Year**	**2012**	**2013**	**2014**
54	Import Electricity Price Increase		12%	8%
55	Ave. Import Electricity Price: inc GST	$0.2189	$0.25	$0.26
56	Solar Export Value from Utility: inc GST	$0.080	$0.080	$0.080
57	STC Price excl GST		$32.00	/REC

Step 4 - Location

6. Enter the state of installation and Location (SA, ACT, VIC, NSW, QLD, TAS, NT or WA). This will automatically select the feed-in tariff rate, type (net or gross), and the remaining number of years of premium FiT. Graph titles automatically update to indicate whether they are relevant to the type of applicable FiT. Select “NA” for sites not receiving a FiT, for example, a commercial site or sites with system size or electricity consumption exceeding FiT regulations.
   To apply a 1-for-1 Retail FiT, select NA and set ‘When Fit Ends, Earn 1-for-1’ to TRUE.
7. Enter the behaviour at the conclusion of the FiT, select TRUE for 1-for-1 or FALSE for PV specific. After the FiT ends, exported power may attract a PV specific value or the same rate as the retail consumption tariff (1-for-1). Select TRUE for ACT, TAS and NT and Vic SFiT to provide 1-for-1.
8. Enter the year of analysis. The remaining FiT duration is automatically calculated. WA remains at 10 years duration, regardless of start date, until being reduced in 2021 (after which the price of electricity is likely to be higher than the FiT anyway).
9. Enter the REC multiplier, which should be 5, 4, 3, 2, or 1, depending on the year and month of installation.
10. Enter the REC Zone, which is based on the postcode of installation (see http://www.orer.gov.au/sgu/index.html for details).
11. Type the STC price, excluding GST.

Step 5 – Commercial Parameters

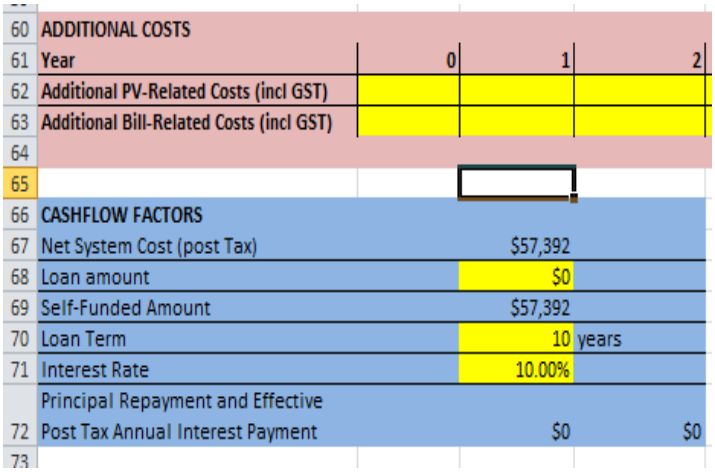
12. Enter your tax bracket and GST % here. If the system is to be sold to a commercial customer, enter the tax bracket of the business to which it’s sold. Most commonly this is 30%. If the system is to be sold to a residential customer, enter 0% in this cell. This cell influences the post-tax cost and revenue (including value of depreciation).
13. If the system is to be sold to a commercial customer that is registered for GST, enter “10%”.

Otherwise enter 0%. This cell influences the post-tax cost and revenue.

14. Enter the depreciation rate. 10% is the standard rate, which uses the current ATO 20-year product lifetime. Small businesses may be able to use a 30% depreciation rate.
15. Enter the discount rate you wish to use to calculate the net present value (NPV) in the discounted cash flow analysis.

Step 6 – Electricity Prices

16. Enter the compounding growth in electricity price from year to year
17. Enter the fixed electricity import price $0.18/kWh (incl GST). This should be the 'average' price paid by the customer, as reflected on their bills. Time-of-use tariffs are not supported in this version of the tool. More specifically, this should be the average price earned by the PV system taking into account time of generation.
18. Enter the price expected for solar earnings when the FiT ends (note that no adder will be added). If 1-for-1 is TRUE (location section), these values are ignored
19. Enter the LGC price for each year, which applies if 'Deem RECs' is set to FALSE, otherwise enter the STC price.
20. Adder to Regular FiT - If the customer receives a premium rate above the state-mandated FiT (some electricity retailers such as Origin provide an additional $0.06/kWh), enter it here. Note that at the end of the FiT, this adder does not apply.



60	ADDITIONAL COSTS			
61	Year	0	1	2
62	Additional PV-Related Costs (incl GST)			
63	Additional Bill-Related Costs (incl GST)			
64				
65				
66	CASHFLOW FACTORS			
67	Net System Cost (post Tax)		$57,392	
68	Loan amount		$0	
69	Self-Funded Amount		$57,392	
70	Loan Term		10	years
71	Interest Rate		10.00%	
72	Principal Repayment and Effective Post Tax Annual Interest Payment		$0	$0
73				

Step 7 – Additional costs

21. Enter any additional yearly PV related costs including GST here, e.g. maintenance costs or extra equipment needed. This affects the PV revenue, cash flow, and true payback calculations.
22. Enter any extra yearly bill related costs here (such as service charges un-related to electricity consumption levels), including GST. This affects the cash flow and net financial position graphs for both 'non PV' and PV solution. It doesn't affect the PV revenue graphs.

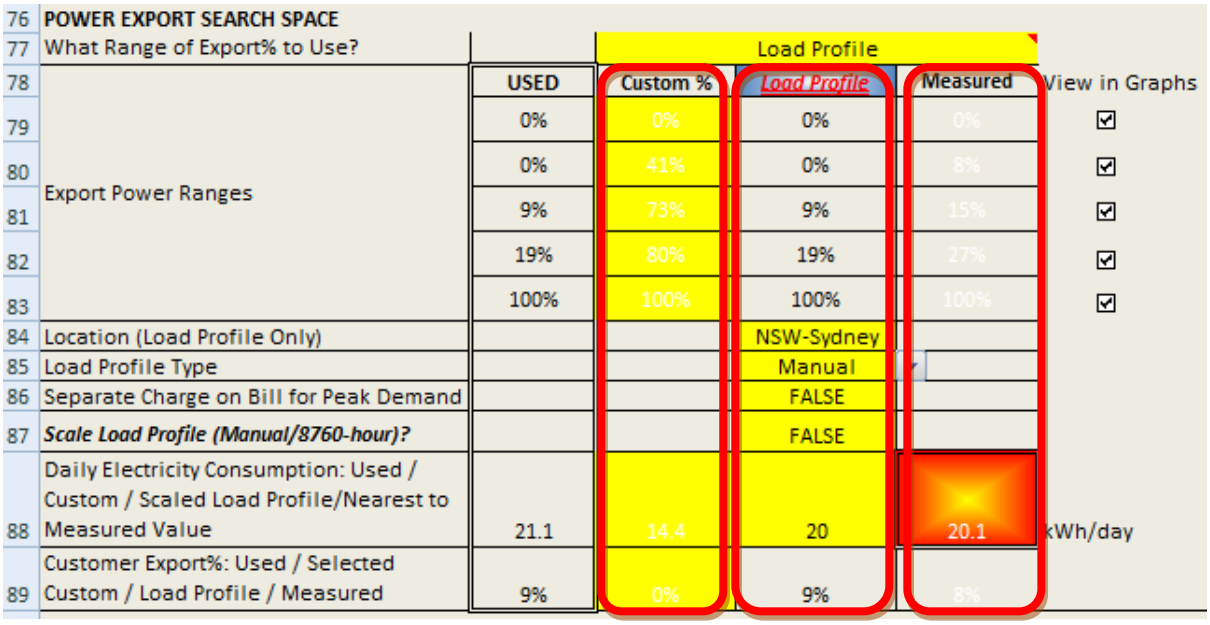
Step 8 - Cashflow Factors

If the customer is purchasing the system on finance, enter the details here.

23. Enter Loan amount. (Deposit amount is automatically calculated as purchase price less loan amount). Hint: Set "=C51" to automatically adjust to the full system price
24. Enter loan term.
25. Enter interest rate of loan.

The effective Post Tax annual Payment is calculated

Step 9 – Power Export Search Space



76	**POWER EXPORT SEARCH SPACE**					
77	What Range of Export% to Use?		Load Profile			
78	Export Power Ranges	USED	Custom %	*Load Profile*	Measured	View in Graphs
79		0%	0%	0%	0%	☑
80		0%	41%	0%	8%	☑
81		9%	73%	9%	15%	☑
82		19%	80%	19%	27%	☑
83		100%	100%	100%	100%	☑
84	Location (Load Profile Only)			NSW-Sydney		
85	Load Profile Type			Manual		
86	Separate Charge on Bill for Peak Demand			FALSE		
87	***Scale Load Profile (Manual/8760-hour)?***			FALSE		
88	Daily Electricity Consumption: Used / Custom / Scaled Load Profile/Nearest to Measured Value	21.1	14.4	20	20.1	kWh/day
89	Customer Export%: Used / Selected Custom / Load Profile / Measured	9%	0%	9%	8%	

26. Referring to Section 3.1 or the table below, select the preferred method of export power methods (custom, load profile, measured). **The corresponding data from the relevant column is transferred across to the "Used" column.** Utilise the check boxes to automatically remove unused lines in graphs and the unused parts of the DCF analysis worksheet.

Suggestions for Export Calculation Method		
Client	**Power Usage**	**Export Calculation Method**
Residential	In range 9-23 kWh/day	Use measured – refer to 'customer output' tab.
Residential	Outside range 9-23 kWh/day	Use load profile - refer to 'customer output tab.
Commercial	Feed-in Tariff eligible	Use load profile - refer to 'customer output' tab.
Commercial	Feed-in tariff ineligible - select state=NA	Use load profile - refer to 'customer output' tab.
Quick analysis (commercial/ residential)	For a range of possible outcomes	Use custom.

Step 9a – Custom Export Calculation Method

a. Enter the range of export percentages you wish to investigate and display on some graphs
b. Enter the Daily Consumption (for cash flow calculations only)
c. Select the nominated export percentage that you wish to display on the bar charts and the customer summary

Step 9b – Load Profile Calculation Method

a. Enter Nearest Location. This loads hourly solar radiation for that location based on a 1 kWp north-facing solar power system inclined at 30°, and scales it to your system size
b. If you have hourly-load data for a full year, select Load Profile Type = '8760-hour load profile', and paste the data into the 'Custom 8760-Hour Load' column in the

1kWSolarOutput tab. Otherwise select from Queensland Residential, NSW Residential, or select Manual and use the hourly tables beneath.

c. Select whether to scale the manual load profile to a set value, or use 'as is'.
d. Enter the daily consumption to which the load profile should be scaled (this cell is ignored if you choose to not scale the manual load profile).

The customer export percentage is thus calculated based upon the entered load profile and 10% less and 10% more export placed into adjacent cells. The boundaries of 0% and 100% export are also pre-filled.

71	**Manual Load Profile**	Watts		1	2	3	4	5
72		Month	January	610	580	540	500	520
73			February	610	580	540	500	520
74			March	610	580	540	500	520
75			April	610	580	540	500	520
76			May	610	580	540	500	520
77			June	610	580	540	500	520
78			July	610	580	540	500	520
79			August	610	580	540	500	520
80			September	610	580	540	500	520
81			October	610	580	540	500	520
82			November	610	580	540	500	520
83			December	610	580	540	500	520
84	**Manual Load Profile Annual Energy Consumption**	**7694.2 kWh/year**						
85								
86	**Scaled Load Profile Based on Above manual load profile as scaled to meet Total Annual Load**	Watts		1	2	3	4	5
87		Month	January	463	440	410	380	395
88			February	463	440	410	380	395
89			March	463	440	410	380	395
90			April	463	440	410	380	395
91			May	463	440	410	380	395
92			June	463	440	410	380	395
93			July	463	440	410	380	395
94			August	463	440	410	380	395
95			September	463	440	410	380	395
96			October	463	440	410	380	395
97			November	463	440	410	380	395
98			December	463	440	410	380	395

e. If using the manual Load Profile Type, enter the site's hourly electricity consumption profile for an average day in each month of the year (in Watts). You may wish to copy and paste an example residential load profile from row 100 onwards

Note that the table below reflects the analyses load profile (after scaling if scaling is selected).

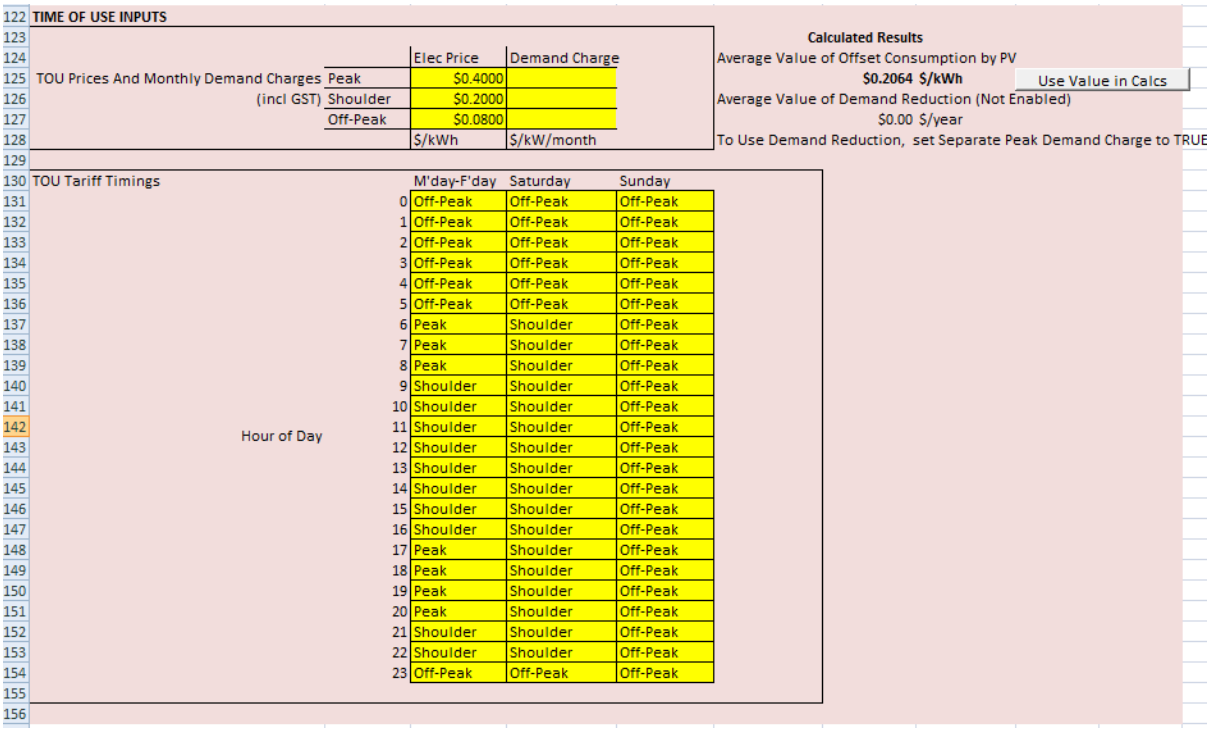
Step 9c – Measured Calculation Method

a. Enter the customer's average daily power consumption for detailed analysis, as reflected on the customer output page(s).

Step 10 – Time of Use Calculator

a. Enter electricity prices for peak, shoulder and off-peak periods, setting the appropriate periods in the area beneath. Then press the "Use Value in Calcs" button on row 138. This will copy an average value for the electricity price into cell B55 above. The average is weighted by the load profile. If you do not want to use the calculator but use your own average electricity price figure instead, then enter it directly into cell B55.

b. Enter values for TOU demand charges if appropriate. If demand charges are flat rate then leave the shoulder and off-peak cells empty. "Enable demand reduction" (cell D86) must be set to true for this to be taken into account. Note that using the default load profiles gives residential consumption patterns (e.g. and evening peak) so no demand reduction value will be generated. To give a realistic estimate of the value, the estimated demand profile, with reduced peak consumption, should be entered in the Manual Load Profile cells.



TIME OF USE INPUTS

TOU Prices And Monthly Demand Charges (incl GST)		Elec Price	Demand Charge
	Peak	$0.4000	
	Shoulder	$0.2000	
	Off-Peak	$0.0800	
		$/kWh	$/kW/month

Calculated Results

Average Value of Offset Consumption by PV
$0.2064 $/kWh Use Value in Calcs
Average Value of Demand Reduction (Not Enabled)
$0.00 $/year
To Use Demand Reduction, set Separate Peak Demand Charge to TRUE

TOU Tariff Timings	Hour of Day	M'day-F'day	Saturday	Sunday
	0	Off-Peak	Off-Peak	Off-Peak
	1	Off-Peak	Off-Peak	Off-Peak
	2	Off-Peak	Off-Peak	Off-Peak
	3	Off-Peak	Off-Peak	Off-Peak
	4	Off-Peak	Off-Peak	Off-Peak
	5	Off-Peak	Off-Peak	Off-Peak
	6	Peak	Shoulder	Off-Peak
	7	Peak	Shoulder	Off-Peak
	8	Peak	Shoulder	Off-Peak
	9	Shoulder	Shoulder	Off-Peak
	10	Shoulder	Shoulder	Off-Peak
	11	Shoulder	Shoulder	Off-Peak
	12	Shoulder	Shoulder	Off-Peak
	13	Shoulder	Shoulder	Off-Peak
	14	Shoulder	Shoulder	Off-Peak
	15	Shoulder	Shoulder	Off-Peak
	16	Shoulder	Shoulder	Off-Peak
	17	Peak	Shoulder	Off-Peak
	18	Peak	Shoulder	Off-Peak
	19	Peak	Shoulder	Off-Peak
	20	Peak	Shoulder	Off-Peak
	21	Shoulder	Shoulder	Off-Peak
	22	Shoulder	Shoulder	Off-Peak
	23	Off-Peak	Off-Peak	Off-Peak

6 Outputs

6.1 Revenue and simple payback

This tab facilitates investigation of a range of power exports under a net FiT. First-year revenue and simple payback (upfront cost divided by first-year revenue) is presented numerically for the selected range of power export percentages. If the simple payback is longer than the remaining FiT duration, the cells are highlighted in red.

Revenue & Simple Payback at Specified REC price and REC Zone

Revenue/ year

% power Export		1.5	2	3	4	5	10 kW
0%		$477	$636	$954	$1,272	$1,590	$3,181
82%		$1,021	$1,361	$2,041	$2,722	$3,402	$6,804
85%		$1,039	$1,385	$2,077	$2,770	$3,462	$6,925
89%		$1,064	$1,419	$2,128	$2,837	$3,547	$7,093
100%		$1,136	$1,515	$2,272	$3,030	$3,787	$7,574
85%	(Customer Out Residential)	$1,039	$1,385	$2,077	$2,770	$3,462	$6,925
100%	(Gross)	$1,136	$1,515	$2,272	$3,030	$3,787	$7,574

SunWiz: Export based Inputs Page Selections

Simple Payback (years)

0%		14.5	15.6	16.6	17.1	17.4	18.0
82%		6.8	7.3	7.8	8.0	8.1	8.4
85%		6.7	7.2	7.6	7.9	8.0	8.3
89%		6.5	7.0	7.4	7.7	7.8	8.1
100%		6.1	6.5	7.0	7.2	7.3	7.6

6.2 Tax Analysis

	Residential (incl GST)	Business (incl GST)	Bar Chart
Customer Price Incl GS	$57,392	$57,392	
GST		$0	$0
RECs	$8,608	$8,608	$8,608
Full Customer Price	$66,000	$66,000	
Depreciation		$0	$0
Net Position		$57,392	$57,392

Net FiT Payback & IRR: 10kW Zone 3 Qld $0.5/kWh $32 RECs	%Export					Selected Customer Output	Ignore this data: Net FiT selected
	0%	82%	85%	89%	100%	85%	Gross FiT
Pre Tax Revenue	$3,181	$6,804	$6,925	$7,093	$7,574	$6,925	$7,574
Post Tax Revenue	$3,181	$6,804	$6,925	$7,093	$7,574	$6,925	$7,574
Simple Payback	18.0	8.4	8.3	8.1	7.6	8.3	7.6
True Payback	12.4	8.4	8.3	8.1	7.7	8.3	7.7
Internal Rate of Return	7.90%	10.39%	10.50%	10.65%	11.10%	10.50%	11.10%

Accounts for FiT Duration	
FiT Duration	17

The tax analysis tab presents a summary of detailed calculations on a chosen system, for both commercial and residential customers. This provides users with the ability to convey payback, and internal rate of return figures.

Calculations are made from data entered on the input page and show -

- The effect of GST, RECs, and 20 years of depreciation on the effective net system price
- Pre-tax and post-tax revenue for commercial customers. Note the tax savings on the upfront

purchases imply taxed income from the PV array, as illustrated in the example at the end of this list.

- Simple Residential payback adjusted for FiT duration
- Simple Business payback adjusted for FiT duration. The payback is calculated as the effective out-of-pocket cost (system price post GST, post tax break, post 20 years of depreciation) divided by the post-tax revenue.
- Business IRR is the "effective interest rate on the investment", known as the Internal Rate of Return. This is calculated based upon the discounted cash flow analysis presented on the "DCF analysis" tab. The IRR takes into account FiT duration, panel degradation, and power price increases.
- Elements of this table are presented graphically on the "Payback&IRR" tab for net FiTs. If a gross FiT is selected, the "GrossFiTPaybackChart presents these. Price breakdown is presented on the "PriceBreakdown" tab.

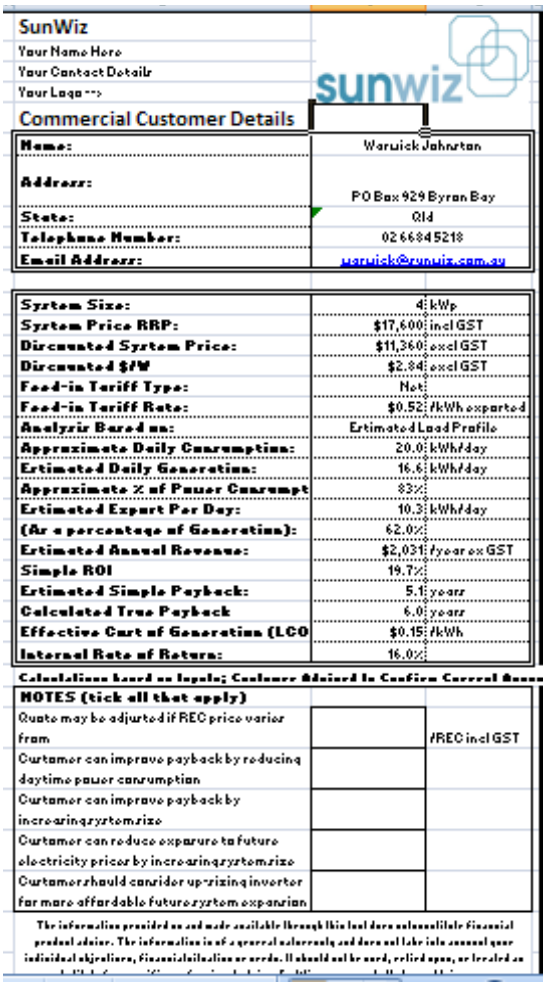
The effect of taxation on PV system revenue: an example

- If a company pays $1100 including GST in electricity bills each year, then after 10% GST is claimed and 30% company tax on the payment is deducted from revenue, then the company is only $700 out of pocket.
- If a solar power system reduces their bill by $220 including GST, then their remaining electricity bill is $880 including GST. After claiming GST and deducting company tax, the company is now only $560 out of pocket. Their solar power system thus created $140 in post-tax revenue (note that this is equivalent to $220 / 110 % * 70%).
- However, while the GST on the company's import electricity is clearly displayed, the GST is not applied to the Solar Bonus Scheme/Feed-in Tariff.
    - This means the company incurs a GST liability on the Feed-in Tariff payments and should rightfully declare this income to the tax office and thus pay GST on it.
    - A 44c/kWh FiT is actually 44c/kWh including GST; a GST-registered business receives 40c/kWh if they declare their GST liability[2].
- In summary, revenue from a solar power system installed on commercial premises should be considered as taxable income.
- Whether the business declares this GST liability or not is up to them. Do not assume they don't declare this tax, as this may be taken as providing advice to evade tax obligations

6.3 Customer Output Residential/Commercial

The Customer Output Tab presents a summary of the data contained within the spread sheet. This is useful for printing a tailored assessment for a customer. The only inputs that should be adjusted on this sheet are the customer details. The remaining cells should be adjusted on the Inputs Tab.

Field	Value/ Notes.
State	QLD, VIC, NSW, ACT, SA, WA, NT, TAS, NA
System Size	Values and graphs below apply to the selected system size, as displayed here
System Price RRP incl GST	Pre -REC price for selected system size.
Discounted System Price incl/excl GST	Post-REC price for selected system size. Note that GST reductions are applied if GST is not set to 0% on the inputs page.
Discounted $/W incl/excl GST	Post-REC post GST (if selected) price divided by system capacity
Feed in Tariff Type	Net/Gross
Feed in Tariff Rate	Standard + Premium FiT
Analysis based on	Estimated Load Profile / Residential Measurements / Estimated Export %, (reflective of chosen export % method)
Average daily power consumption	Daily consumption as selected on inputs page and as corresponding with export calculation method
Estimated Generation	System performance entered on inputs tab for selected system size
Approximate % of Power Consumption:	Generation ÷ Consumption
Estimated Export Per Year:	As calculated from Generation and Export %
(As a percentage of Generation):	Export % output from chosen export calculation method
Estimated Annual Revenue:	First-year Revenue (pre-tax, and post-tax on the commercial tab)
Simple ROI	Return on investment based on upfront cost and first year revenue (i.e. with no discounting)
Estimated Simple Payback:	First year discounted price ÷ First year Revenue. Commercial Tab uses: (First year discounted price – twenty-years depreciation) ÷ Post Tax First year Revenue
Calculated True Payback:	True payback accounting for rising electricity prices, panel degradation, and depreciation (if tax applies).
Internal Rate of Return	Effective Interest Rate on Investment (over 20 years).



SunWiz

Your Name Here

Your Contact Details

Your Logo --->

sunwiz

Commercial Customer Details

Name:	Warwick Johnston
Address:	PO Box 929 Byron Bay
State:	Qld
Telephone Number:	0266845218
Email Address:	warwick@sunwiz.com.au

System Size:	4	kWp
System Price RRP:	$17,600	incl GST
Discounted System Price:	$11,360	excl GST
Discounted $/W	$2.84	excl GST
Feed-in Tariff Type:	Net	
Feed-in Tariff Rate:	$0.52	/kWh exported
Analysis Based on:	Estimated Load Profile	
Approximate Daily Consumption:	20.0	kWh/day
Estimated Daily Generation:	16.6	kWh/day
Approximate % of Power Consumpt	83%	
Estimated Export Per Day:	10.3	kWh/day
(As a percentage of Generation):	62.0%	
Estimated Annual Revenue:	$2,031	/year ex GST
Simple ROI	19.7%	
Estimated Simple Payback:	5.1	years
Calculated True Payback	6.0	years
Effective Cost of Generation (LCO	$0.15	/kWh
Internal Rate of Return:	16.0%	

Calculations based on Inputs; Customer Advised to Confirm Correct Assu

NOTES (tick all that apply)		
Quote may be adjusted if REC price varies from		/REC incl GST
Customer can improve payback by reducing daytime power consumption		
Customer can improve payback by increasing system size		
Customer can reduce exposure to future electricity prices by increasing system size		
Customer should consider up-sizing inverter for more affordable future system expansion		

The information provided on and made available through this tool does not constitute financial product advice. The information is of a general nature only and does not take into account your individual objectives, financial situation or needs. It should not be used, relied upon, or treated as

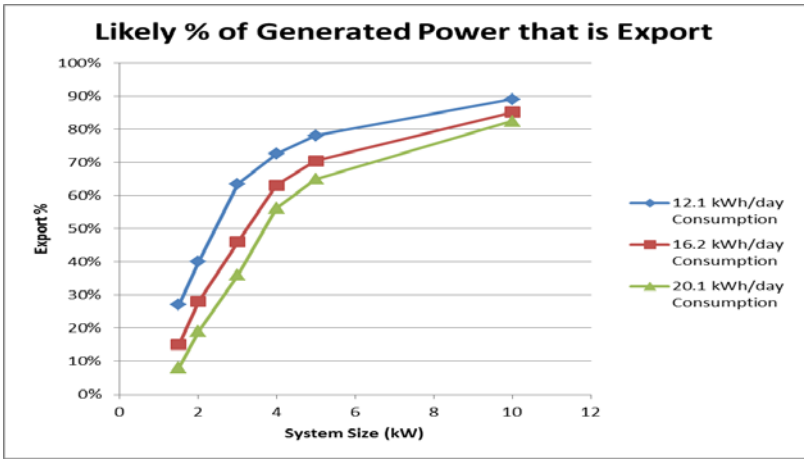
You are welcome to put your logo and contact details at the top of the page. Some checkboxes with ‘leading’ customer advice are provided at the bottom of the summary, which can be printed and left with the customer. The remainder of these charts show a summary of the important graphs. It is possible to print these neatly by selecting each graph individually and printing.

6.4 Likely Net FiT Payback

This graph provides industry-measured PV generation in relation to three categories of daily residential electricity consumption, and the corresponding export from a 1-3kW PV system. Naturally, the time of day of consumption will influence a particular customer's outcome, but this data provides a baseline estimate calculated from measurements rather than pure guesses. This data is most accurate for Sydney solar radiation and energy consumption.

The second graph shows the same data, projected to larger system sizes, with data points at each of the system sizes selected in the "Inputs" tab.

This data is only relevant for residential systems, and ignores the likelihood that a house with a roof large enough to hold a 10kW system would have very high power consumption.



The value of the graphs lies is in demonstrating the large increase in exported power from a small increase in system size, or from a decrease in power consumption. This is translated into simple payback (highlighted red where the simple payback exceeds the remaining FiT duration), and illustrated graphically in the 'LikelyNetFitPaybackChart' tab.

Note that some chart titles will automatically update, and remind you that they are irrelevant if a gross FiT is selected.

2	**Likely % of generated power that is export**				**System Size (kW)**			
3	**kWh/year**	**kWh/day**	**1.5**	**2**	**3**	**4**	**5**	**10**
4	4400	12.1	27%	40%	64%	73%	78%	89%
5	5900	16.2	15%	28%	46%	63%	70%	85%
6	7350	20.1	8%	19%	36%	56%	65%	82%
7								
8	**Likely kWh of generated power that is export**		**1.5**	**2**	**3**	**4**	**5**	**10**
9	**Generation**	kWh/day	6.23	8.30	12.45	16.60	20.75	41.50
10	**Daytime Consumption**	12.1	4.54	4.98	4.54	4.54	4.54	4.54
11		16.2	5.29	5.98	6.72	6.13	6.13	6.13
12		20.1	5.73	6.72	7.97	7.27	7.27	7.27
13								
14								
15	**Likely Simple Payback vs System Size, with Feed-in Tariff of $0.5/kWh**				**System Size (kW)**			
16		**Consumption**	**1.5**	**2**	**3**	**4**	**5**	**10**
17		**12.1 kWh/day**	10.6	10.0	8.8	8.5	8.4	8.1
18		**16.2 kWh/day**	12.0	11.2	10.1	9.1	8.8	8.3
19		**20.1 kWh/day**	13.1	12.3	11.1	9.6	9.2	8.4
20	*Now accounts for FiT Duration, but not degradation or power price increase							
21								
22	FiT Duration	17						

6.5 Likely Gross FiT Payback

This tab shows the same information as the Likely Net FiT Payback tab, except for a gross FiT (with 100% of the energy generation being exported). Note that some chart titles will automatically update, and remind you that they are irrelevant if a net FiT is selected.

Ignore this data: Net FiT Selected		System Size (kW)					
		1.5	2	3	4	5	10
	Payback	3.3	4.3	5.0	5.5	5.9	6.4
FiT Duration	18						

6.6 DCF Analysis (Discounted Cash Flow)

This tab shows the workings of the true payback and IRR calculations. It calculates the true payback of a system, taking into account increasing prices of electricity, panel degradation, post tax revenue and PV-related expenses, and depreciation of the system, over a user defined period (default 25 years). The analysis is repeated for each of the export % in the range selected on the inputs tab.

Note that the PV-Related additional costs affect this analysis; the Bill-related additional costs do not.

1			System Size	10					Zone	3	RECs	269									
2	Discount Rate	7%									REC price	32									
3	Tax rate	0%																			
4	Bonus Tax Break	TRUE																			
5	Analysis Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
6	Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
7	Export Price of Electricity incl GST	$0.50	$0.50	$0.50	$0.50	$0.50	$0.50	$0.50	$0.50	$0.50	$0.50	$0.50	$0.50	$0.50	$0.50	$0.50	$0.50	$0.50	$0.16	$0.16	$0.17	$0.18
8	Import Price of Electricity incl GST	$0.21	$0.24	$0.25	$0.27	$0.29	$0.30	$0.32	$0.33	$0.35	$0.37	$0.39	$0.41	$0.43	$0.45	$0.47	$0.49	$0.52	$0.54	$0.57	$0.60	$0.63
9	System Output	15,148	15,072	14,996	14,921	14,847	14,773	14,699	14,625	14,552	14,479	14,407	14,335	14,263	14,192	14,121	14,050	13,980	13,910	13,841	13,771	13,703
10	LCOE multiplier	1.00	0.93	0.87	0.82	0.76	0.71	0.67	0.62	0.58	0.54	0.51	0.48	0.44	0.41	0.39	0.36	0.34	0.32	0.30	0.28	0.26
11	LCOE	$0.31	/kWh																			
12	Export	0%																				
13	**Revenue**																					
14	RECs	8,608	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	Electricity Generation		3,181	3,545	3,809	4,094	4,277	4,468	4,668	4,877	5,095	5,323	5,561	5,810	6,070	6,342	6,626	6,922	7,232	7,556	7,894	8,247
16	Depreciation tax saving		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	**Total revenue**	**8,608**	**3,181**	**3,545**	**3,809**	**4,094**	**4,277**	**4,468**	**4,668**	**4,877**	**5,095**	**5,323**	**5,561**	**5,810**	**6,070**	**6,342**	**6,626**	**6,922**	**7,232**	**7,556**	**7,894**	**8,247**
18																						
19	**Expenses**																					
20	Design and Install	66,000																				
21	Additional Costs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	**Total expenses**	**66,000**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23																						
24	Net cashflow	- 57,392	3,181	3,545	3,809	4,094	4,277	4,468	4,668	4,877	5,095	5,323	5,561	5,810	6,070	6,342	6,626	6,922	7,232	7,556	7,894	8,247
25	Cumulative Cashflow	- 57,392	- 54,211	- 50,666	- 46,857	- 42,763	- 38,487	- 34,019	- 29,351	- 24,474	- 19,378	- 14,055	- 8,494	- 2,684	3,387	9,728	16,354	23,276	30,508	38,064	45,958	54,204
26	PV	- 57,392	2,973	3,096	3,110	3,123	3,049	2,977	2,907	2,838	2,771	2,706	2,642	2,580	2,519	2,459	2,401	2,345	2,289	2,235	2,183	2,131
27	**NPV**	- 4,056																				
28	**IRR**	**7.90%**	**-94.46%**	**-72.22%**	**-52.31%**	**-37.78%**	**-27.53%**	**-20.11%**	**-14.59%**	**-10.38%**	**-7.10%**	**-4.49%**	**-2.39%**	**-0.67%**	**0.75%**	**1.95%**	**2.95%**	**3.81%**	**4.54%**	**5.18%**	**5.73%**	**6.21%**
29	True Payback	12.44																				
30	All figures net of tax																					

6.7 Depreciation Schedule

This tab calculates the depreciation of the system over a 20 year period using the Australian Tax Office mandated depreciation value of 10% pa.

6.8 Cash Flow

The “Cashflow” tab provides operators the opportunity to demonstrate the effect of rising power prices on customer’s annual and 25-year electricity spend.

The electricity bill, solar revenue, and depreciation are calculated for each of 20 years, accounting for panel degradation and the increase in the price of imported electricity. Any PV-related cost is reflected in the electricity revenue, and any bill-related costs are reflected in the Electricity cost.

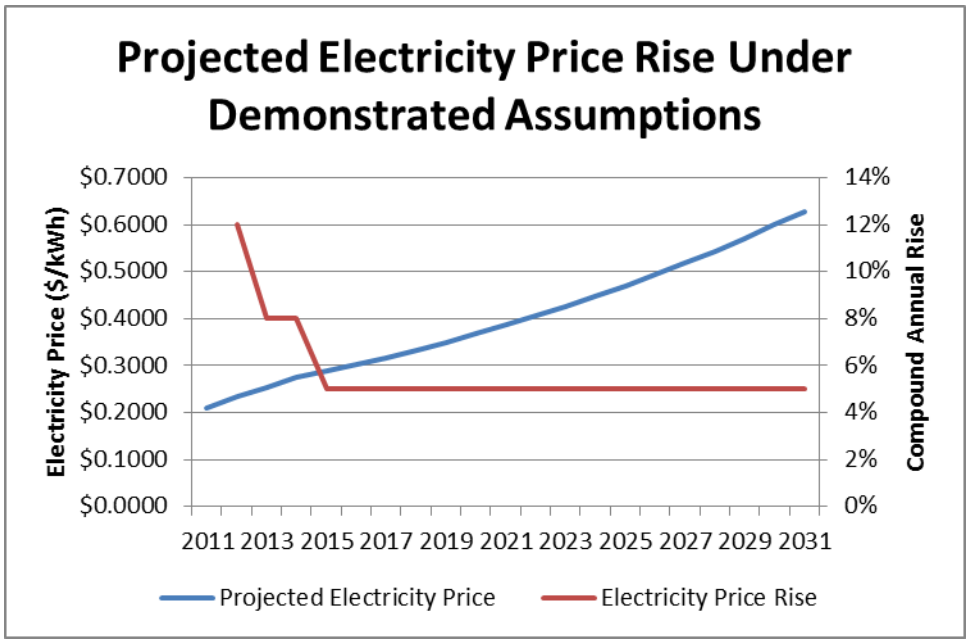
Accumulated cash flow is presented in the ‘net position – self funded’ table, assuming the full cost of the system is paid up front. This cash flow is presented graphically in the “Net Position – Self Funded” tab.

Annual cash flow is presented in the ‘annual cash flow – with loan’ table, with details of the loan. This cash flow is presented graphically in the “Annual Cashflow – self funded” tab.

Accumulated cash flow is presented in the ‘net position – with loan’ table, with details of the loan. This cash flow is presented graphically in the “Net Position – with loan” tab.

Annual cash flow is presented in the ‘annual cash flow – with loan’ table, with details of the loan. This cash flow is presented graphically in the “Annual Cashflow, with loan” tab.

6.9 Projected Electricity Price



6.9.1 Description

This graph shows the electricity price that will occur if the assumptions about annual compound growth entered in the inputs hold true.

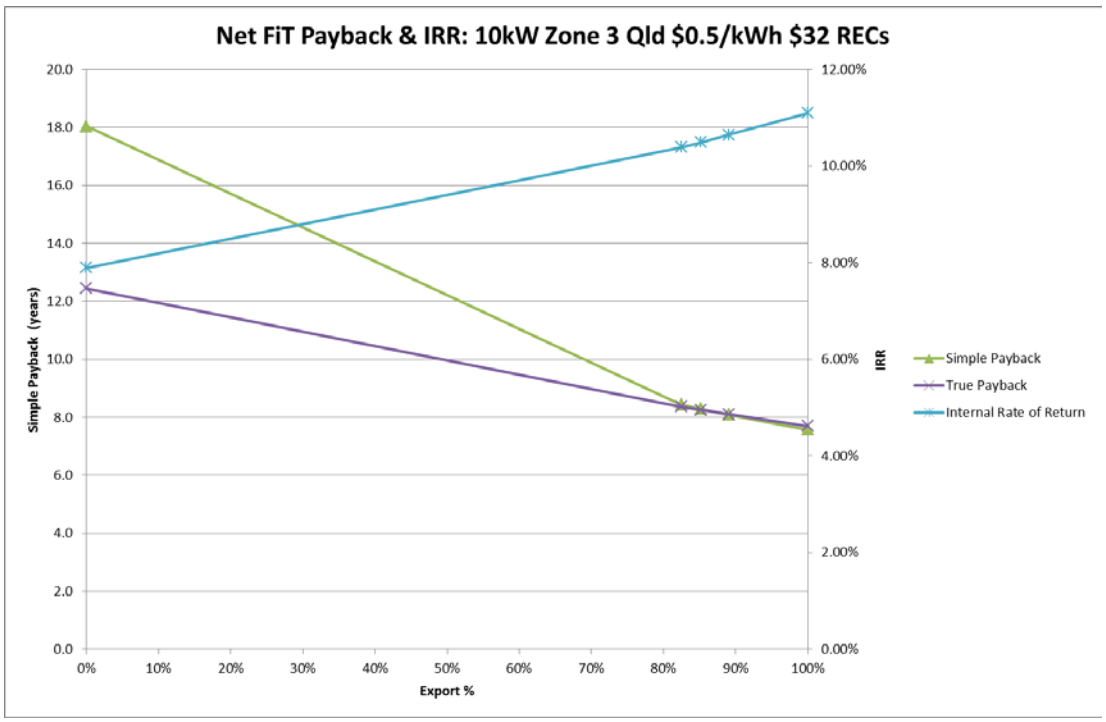
6.9.2 Sales Use

This could be used to suggest to customers how soon a doubling in electricity price could occur. This may encourage customers to purchase a system that provides them with a fixed-cost electricity source: solar power.

6.9.3 Interpretation

The red line displays the annual compound electricity price growth entered in the inputs page. The blue line shows the resulting average electricity price paid.

6.10 Net FiT Payback and IRR



6.10.1 Description

This graph shows the simple payback, true payback, and Internal Rate of Return for the nominated system over the used range of export power percentages.

6.10.2 Sales Use

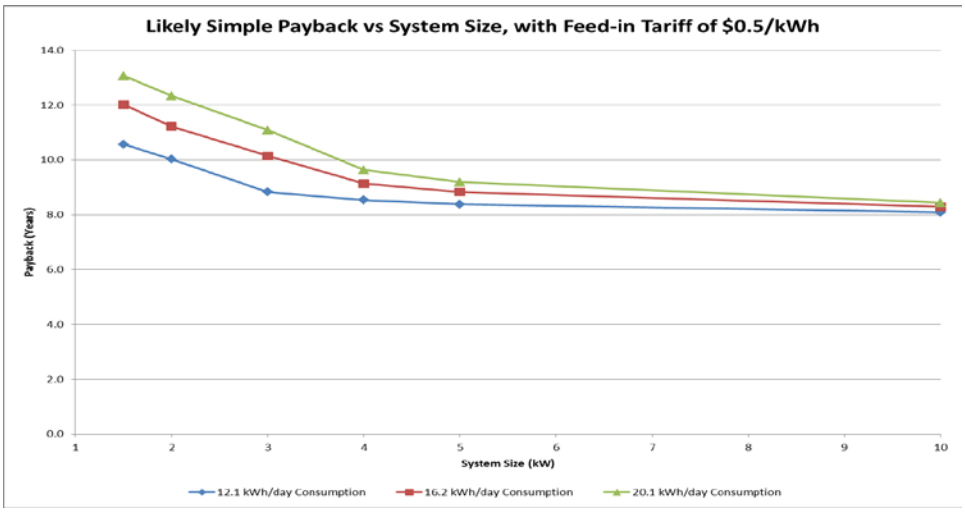
Show customers their likely true payback and internal rate of return, and what might happen if they reduce their power consumption by a little. Provide confidence that the worst-case outcome (no export) isn't really so bad after all, so they're almost certainly going to have a good outcome regardless of the amount of power they export. Show customers how honest and truthful your calculations are.

6.10.3 Interpretation

Read payback (green and purple lines) off the left axis. Read IRR (blue line) off the right axis. Each of the used export power percentages has a marker.

The True payback is often less than the simple payback for low export percentages on a net FiT. This is because financial outcome on systems with low exports is more affected by rising electricity prices than systems earning mostly FiT (which remains constant each year). The simple payback can by shorter than the true payback as it doesn't account for depreciation or degradation.

6.11 Likely Net FiT Payback Chart



6.11.1 Description

This graph shows the likely simple payback for the chosen range of system sizes using the measured export calculation method.

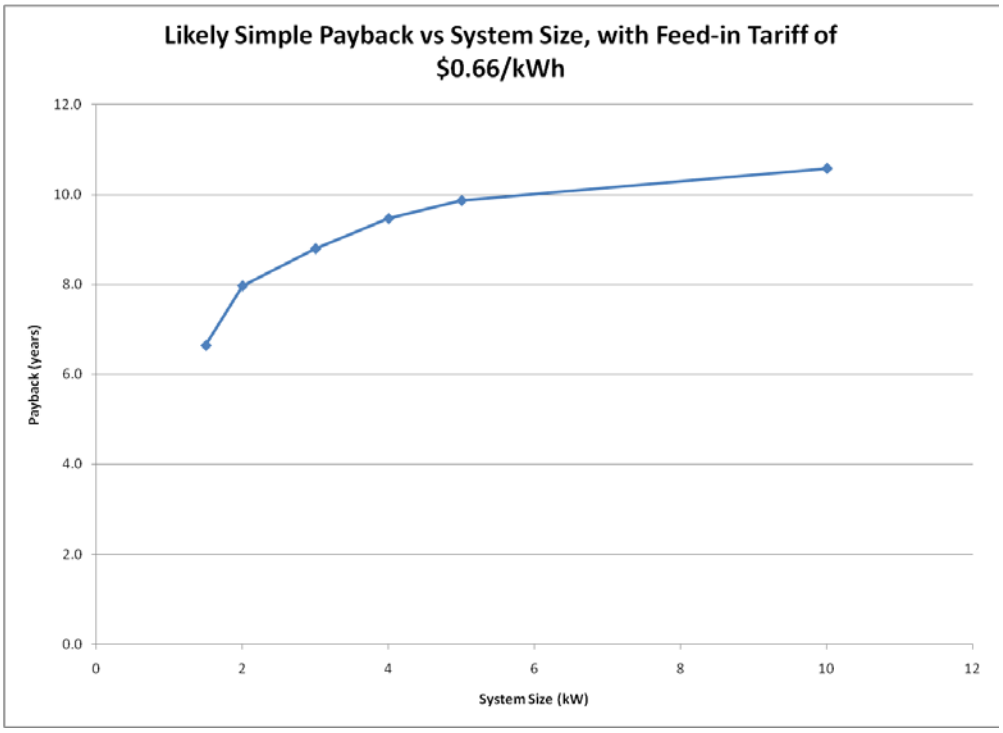
6.11.2 Sales Use

This chart can be very effective in conveying a sales message that encourages up-sizing and cross-selling of energy efficiency products. Looking vertically at this chart (fixed system size, variable power consumption) demonstrates to the customer the value of energy efficiency, which can result in much quicker payback. Looking horizontally at this chart (fixed power consumption, variable system size) may demonstrate to the customer the value of increasing system size, which will result to significantly more export power and revenue and might result in quicker payback, depending on your system and REC prices. Remember however, that payback is just one way of evaluating a solar outcome. For example, if a replacement inverter is required during the life of the panels, a larger inverter costs proportionally less than a smaller inverter, thus having a smaller impact upon the overall financial profitability.

6.11.3 Interpretation

This graph shows the likely simple payback of 6 systems, by evaluating the likely amount of power exported from each system (based on industry measurement and calculations presented in the “Likely net-FiT Payback” tab), the likely amount of revenue can be calculated, and thus the likely payback.

6.12 Gross FiT Payback Chart



6.12.1 Description

This graph shows the likely simple payback for the chosen range of system sizes on a gross FiT. This is the gross FiT equivalent graph to that shown in Section 6.13.

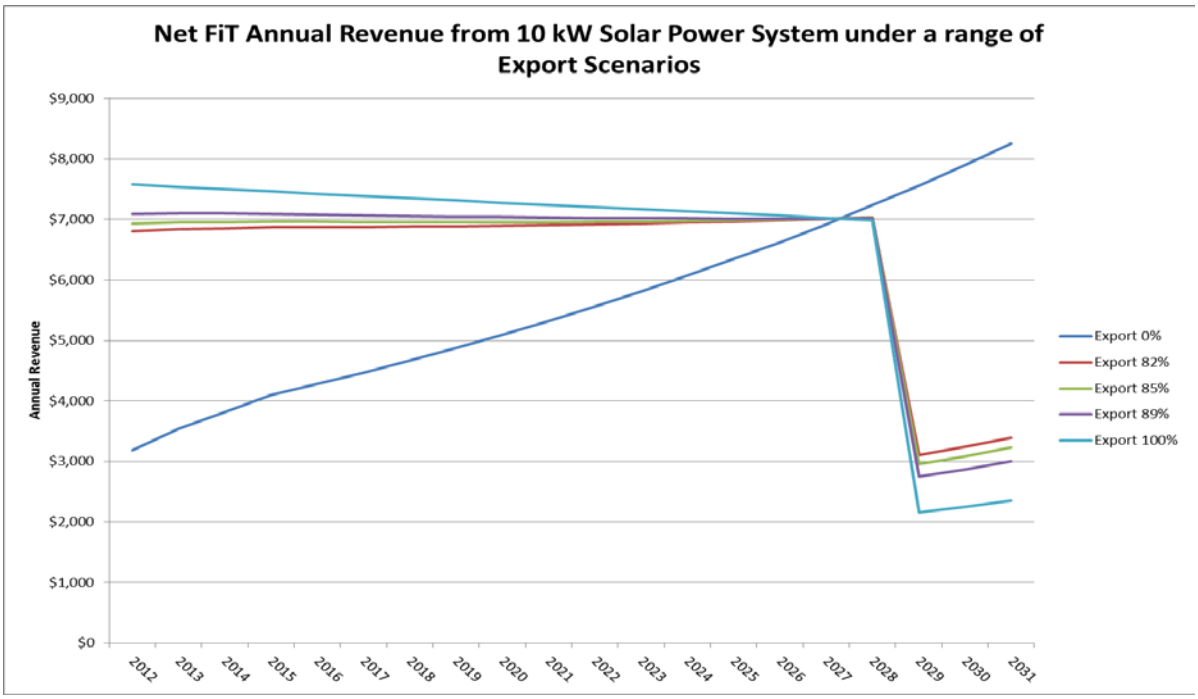
6.12.2 Sales Use

This chart (fixed power consumption, variable system size) may demonstrate to the customer the value of increasing system size, depending on your system and REC prices. Remember however, that payback is just one way of evaluating a solar outcome. For example, if a replacement inverter is required during the life of the panels, a larger inverter costs proportionally less than a smaller inverter, thus having a smaller impact upon the overall financial profitability

6.12.3 Interpretation

This graph shows the simple payback of 6 systems

6.13 Net FiT Solar Revenue



6.13.1 Description

This graph shows the post-tax annual revenue from electricity sales of the selected solar power system, for the selected range of export percentages on a net FiT.

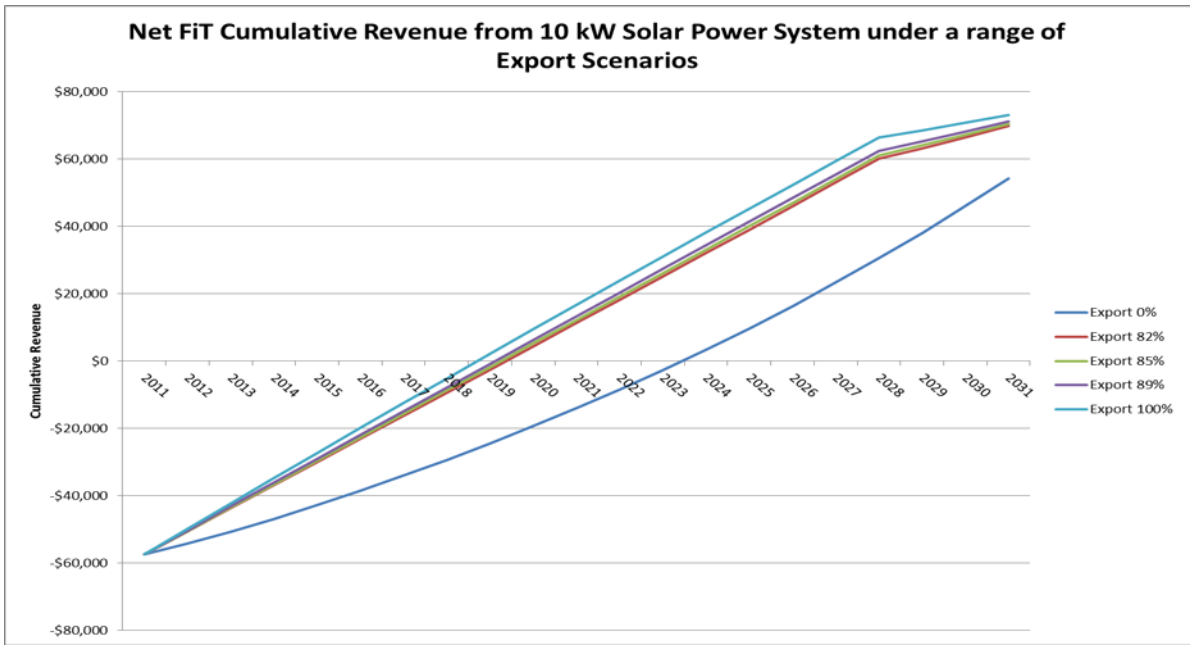
6.13.2 Sales Use

This graph can be used to visually demonstrate how the amount of revenue created the solar power system may effectively increase over time (especially for low export percentages), as the electricity price increases.

6.13.3 Interpretation

The competing effect of panel degradation and increasing electricity prices can be seen in this graph. Revenue under 100% export declines with degradation until (under the assumptions of a 7% annual increase in electricity price), export power has the same value of the import power. At this stage, the electricity price growth is greater than panel degradation, so the curve trends upwards. Western Australian customers might also see the end of the FiT displayed clearly on their graph.

6.14 Net FiT Cumulative Revenue



6.14.1 Description

This graph shows the cumulative post-tax position of a customer that has bought the selected solar power system, for the selected range of export percentages on a net FiT.

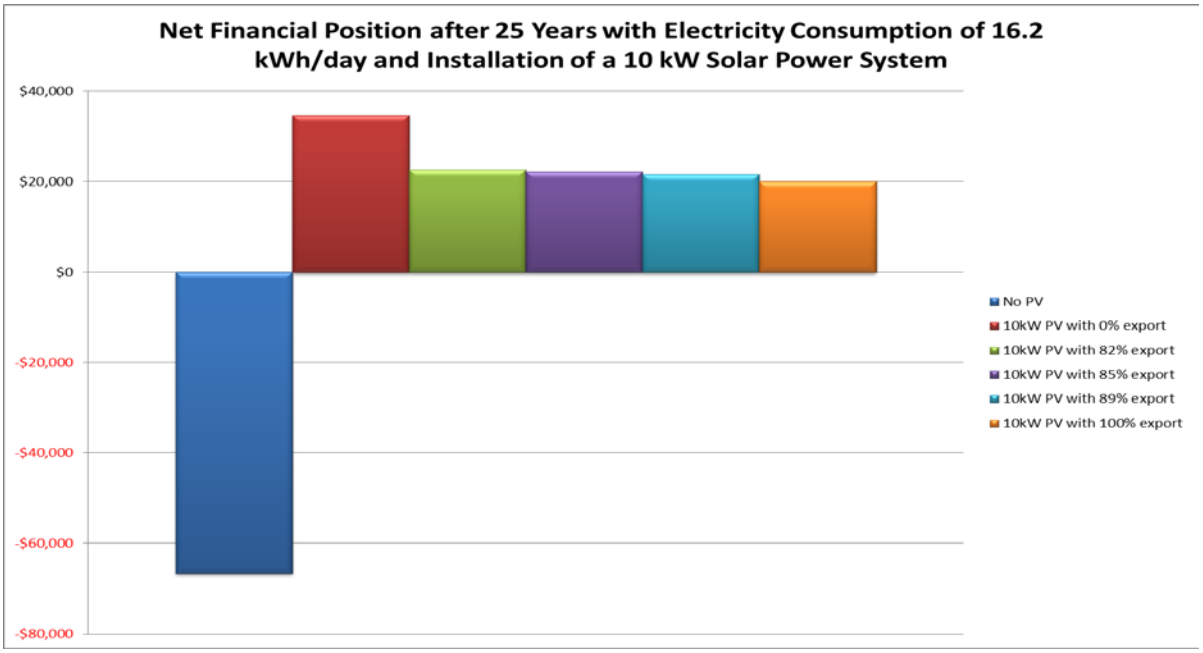
6.14.2 Sales Use

This graph can be used to demonstrate the customer's initial outlay is more than paid back within the life of the system, that they can earn two to three times their investment.

6.14.3 Interpretation

True payback occurs when the relevant line crosses the x-axis.

6.15 Net Financial position nFiT



6.15.1 Description

This graph shows the cumulative post-tax position 20 years after a customer that has bought the selected solar power system, for a range of export percentages under a net FiT.

6.15.2 Sales Use

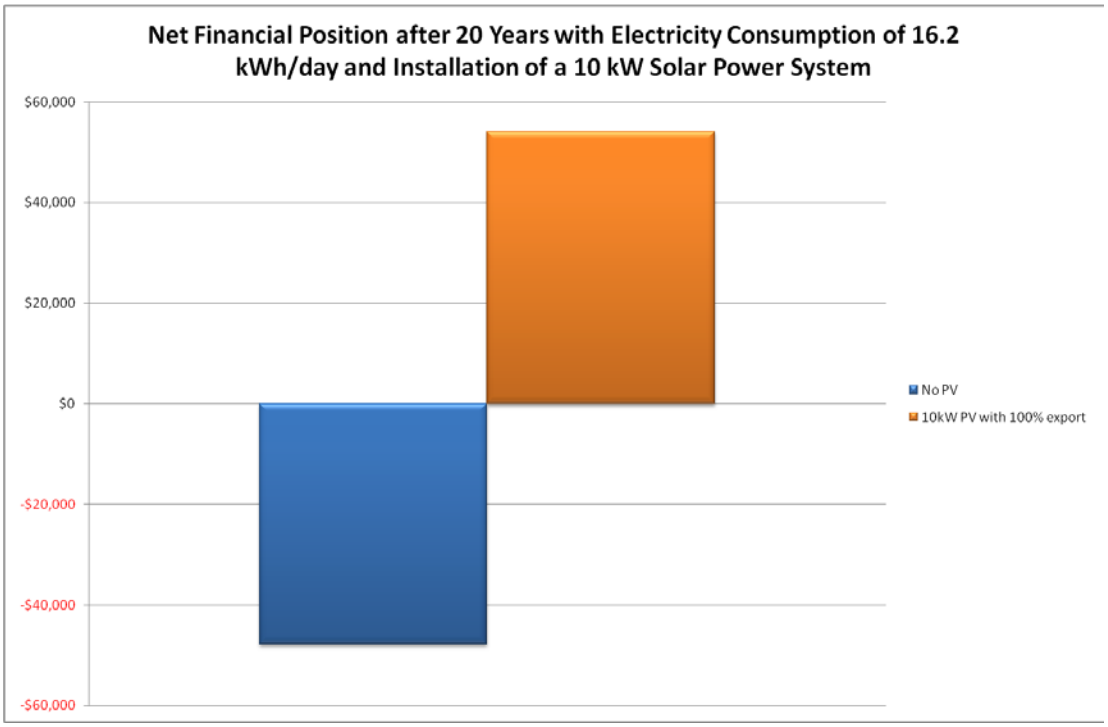
This graph can be used to simply compare the customer's net financial position if they don't install PV, or their likely financial position if they do, with a best case (100% export) and worst case (0% export). It can show the customer the scary amount of electricity expenditure over 20 years, compared with an initial outlay of a smaller amount that results in a far greater profit.

Note that for a small system size, PV installation may still result in a negative financial position (although still better than no purchase). This is because power production is far less than power consumption, and thus the customer's electricity bill isn't fully offset (especially considering increased electricity prices). Thus this graph can be used to up-sell to a system that covers more of their energy usage.

6.15.3 Interpretation

Pretty straightforward: Would you rather be on the left-most bar, or one of the other bars?

6.16 Net Financial Position qFiT



6.16.1 Description

This graph shows the cumulative post-tax position 20 years after a customer that has bought the selected solar power system, for a gross FiT.

6.16.2 Sales Use

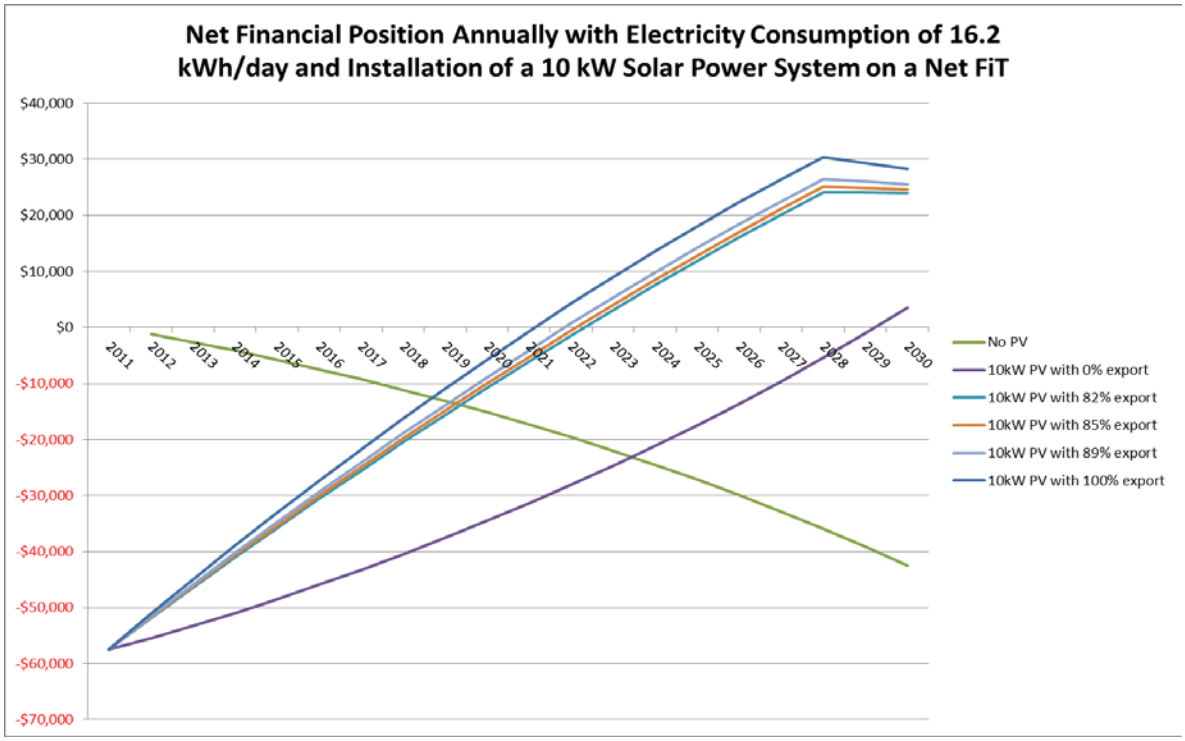
This graph can be used to simply compare the customer's net financial position if they don't install PV, or their likely financial position if they do, with a best case (100% export) and worst case (0% export). It can show the customer the scary amount of electricity expenditure over 20 years, compared with an initial outlay of a smaller amount that results in a far greater profit.

Note that for a small system size, PV installation may still result in a negative financial position (although still better than no purchase). This is because power production is far less than power consumption, and thus the customer's electricity bill isn't fully offset (especially considering increased electricity prices). Thus this graph can be used to up-sell to a system that covers more of their energy usage.

6.16.3 Interpretation

Pretty straightforward: Would you rather be on the left-most bar, or the right-most bar?

6.17 Net Position – Self Funded



6.17.1 Description

This graph show the customers cumulative expenditure on electricity and solar power, taking into account any additional PV-related and bill-related costs. This is similar to the PV revenue graph shown in Sections 6.15 and 6.16, but includes money spent on electricity consumption.

6.17.2 Sales Use

This graph can be used to simply compare the customer's net financial position if they don't install PV, or their likely financial position if they do, with a best case (100% export) and worst case (0% export).

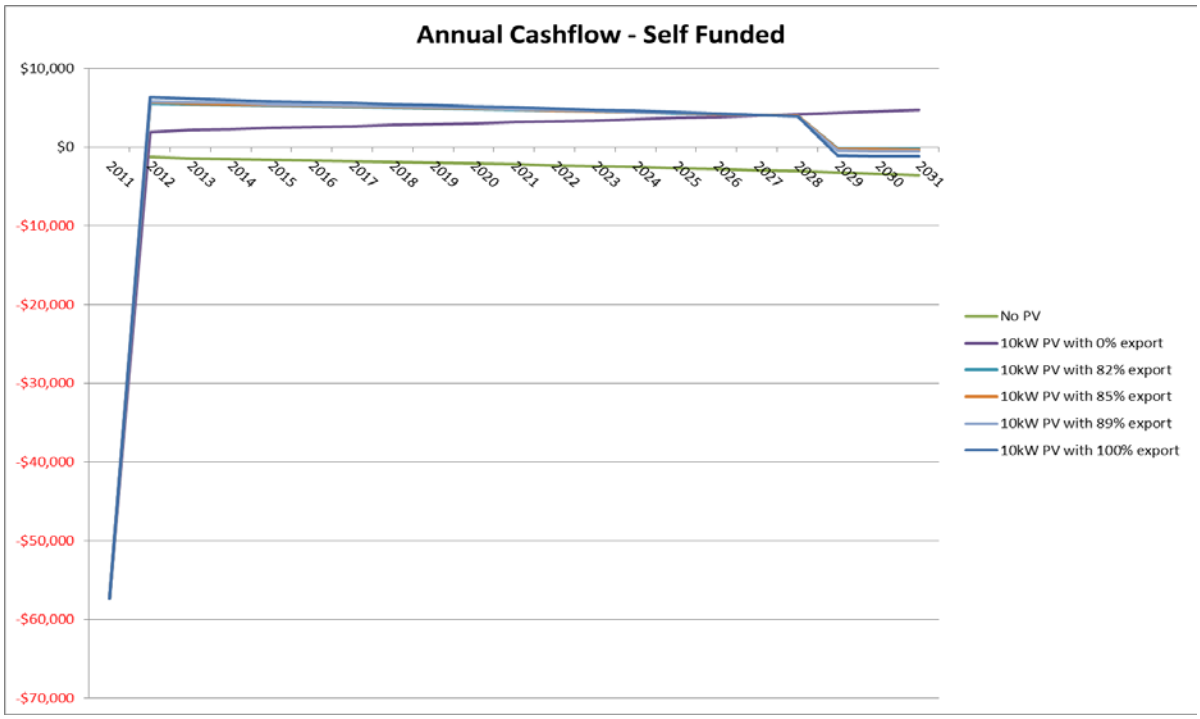
6.17.3 Interpretation

This graph presents a cumulative position, which is simpler to interpret than annual cash flow presented later.

Simplistically, the downwards going curve shows that not investing in a PV is bad, especially when compared with the upwards curve that results from a PV purchase. Payback is where the green line crosses the line associated with the expected PV export.

Note that installation of a small system at a location with high power consumption may result in a graph in which all lines trend downwards. Similar may occur in NSW after the end of the FiT. Though still better off than not purchasing a PV system, this may encourage customers to buy a larger system.

6.18 Annual Cash Flow – Self Funded



6.18.1 Description

In contrast to the cumulative graph presented in Section 6.21, this graph shows the annual cash flow resulting from PV installation under various amounts of power exports, as compared to the customer's electricity bill. It shows post tax (post depreciation offset) cash flow.

6.18.2 Sales Use

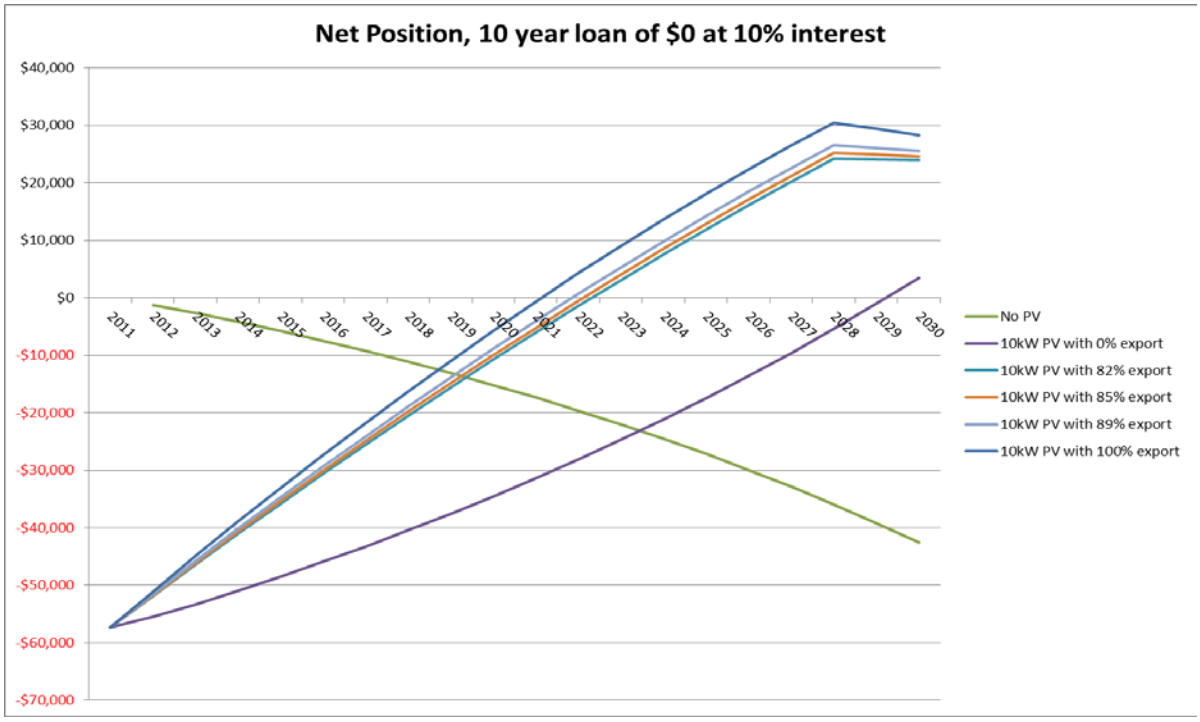
Although not as scary a graph as the cumulative equivalent presented in Section 6.21, this can help customers identify what will happen to their bill when the FiT ends, or identify the year in which the power price reaches the FiT.

If a customer isn't creating enough revenue to offset their bill, the lines may slope downwards as the electricity price rises. This can be a good incentive to purchase a larger system (or add more panels at a later date).

6.18.3 Interpretation

Generally the lines with high levels of export power slope downwards because of panel degradation. Upward sloping lines associated with low power export can demonstrate that electricity prices are more than compensating for panel degradation. Lines can also slope downwards due to depreciation, which results in a large tax savings in early years and small tax savings in later years.

6.19 Net Position – With Loan



6.19.1 Description

This graph shows net financial position if the customer takes out a loan to pay for their system. Similarly to Section 6.21, this graph shows cumulative expenditure.

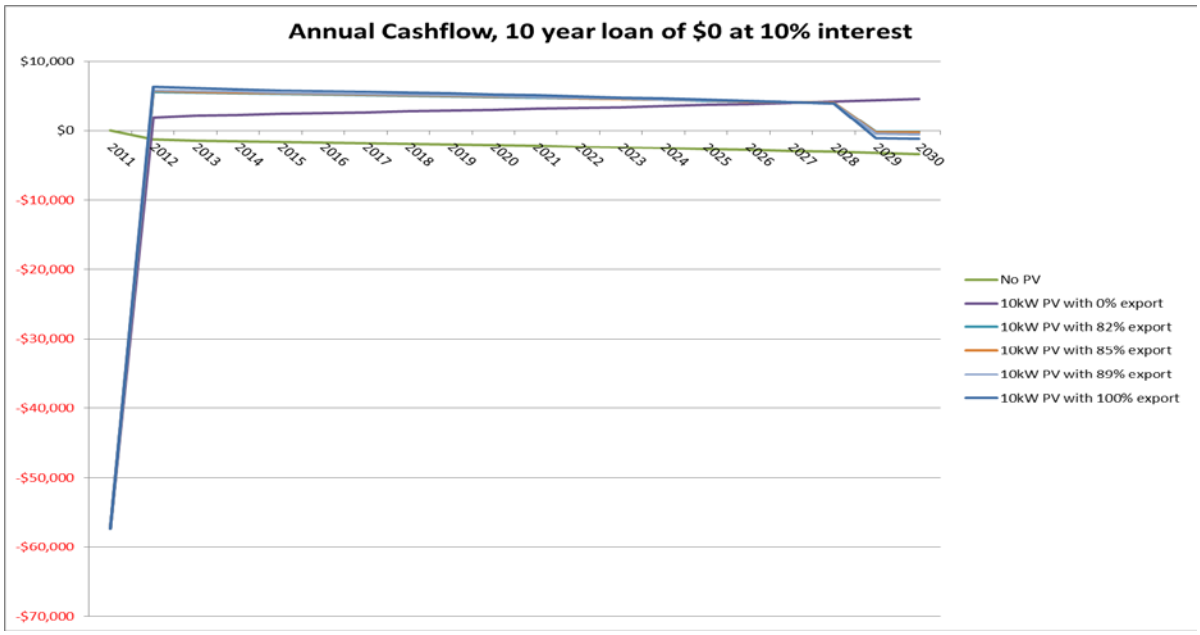
6.19.2 Sales Use

This graph may illustrate to customers that if they refinance their home loan, their net position is not much worse off while they repay the system, after which they are far ahead. Effectively, instead of paying a larger electricity bill, the savings from their electricity bill pay off their system. After their system is paid off, they can have free electricity.

6.19.3 Interpretation

This can be a complex graph, depending on the system size, customer's consumption, loan term, and interest rate. When the line associated with the customer's purchase sits above the green line, then they're ahead (paid back). In the example above, they're ahead from the beginning.

6.20 Annual Cash Flow – With Loan



6.20.1 Description

This graph shows annual cash flow associated with the net financial position associated with taking out a loan, as compared to the cumulative position that was shown in 6.23.

6.20.2 Sales Use

This graph is quite complex, but clearly shows the end of the repayment period, and the many years of electricity cheques that follow before the electricity price skyrockets.

6.20.3 Interpretation

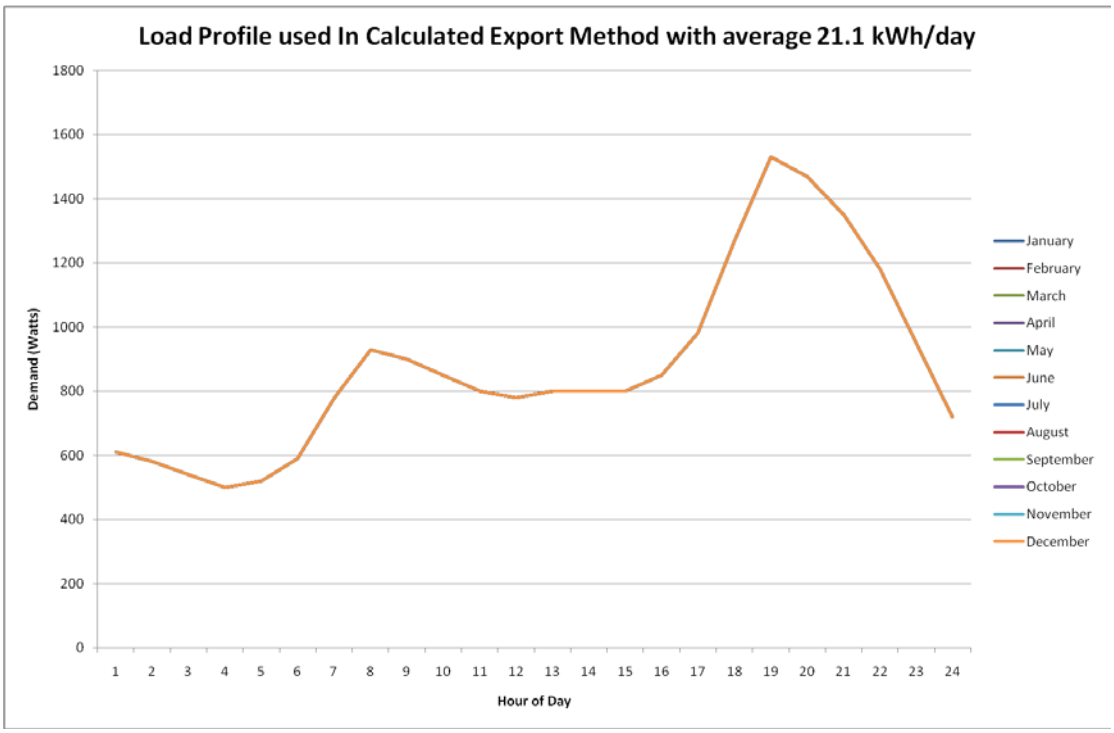
This can be a complex graph, depending on the system size, customer's consumption, loan term, and interest rate.

6.21 1kW Solar Output

This tab is mostly used for load profile export calculation purposes. It shows the simulated output from a north-facing 30°-inclined 1 kW solar power system for each of Australia's capital cities (as simulated using Solar Advisor Model). This output is then scaled by the system size to calculate the export, when compared to the load. There is also a column that allows custom solar power system to be entered (e.g. from a different location). SunWiz can provide hourly solar radiation data for the following locations upon request.

ACT-Canberra	NT-Alice Springs	SA-Adelaide	WA-Albany
NSW-Armidale	NT-Darwin	SA-Ceduna	WA-Broome
NSW-Blue Mountains	NT-Katherine	SA-Mt Gambier	WA-Carnarvon
NSW-Cabramurra	NT-Tennant Creek	SA-Roxby Downs	WA-Esperance
NSW-Cobar	QLD-Amberly	SA-Woomera	WA-Forrest
NSW-Coffs Harbour	QLD-Atherton	TAS-Hobart	WA-Geraldton
NSW-Cooma	QLD-Brisbane	TAS-Launceston	WA-Giles
NSW-Dubbo	QLD-Cairns	VIC-Ballarat	WA-Halls Creek
NSW-Moree	QLD-Charleville	VIC-Cape Otway	WA-Kalgoorlie
NSW-Nowra	QLD-Gladstone	VIC-Coldstream	WA-Katanning
NSW-Orange	QLD-Longreach	VIC-East Sale	WA-Learmonth
NSW-Parramatta	QLD-Mackay	VIC-Melbourne	WA-Mandurah
NSW-Richmond	QLD-Maleny	VIC-Mildura	WA-Manjimup
NSW-Sydney	QLD-Mt Isa	VIC-Warrnambool	WA-Meekatharra
NSW-Thredbo	QLD-Oakey		WA-Newman
NSW-Wagga Wagga	QLD-Rockhampton		WA-Perth
NSW-Williamtown	QLD-Townsville		WA-Port Hedland
	QLD-Weipa		WA-Swanbourne
			WA-Wyndham

6.22 Load Profile



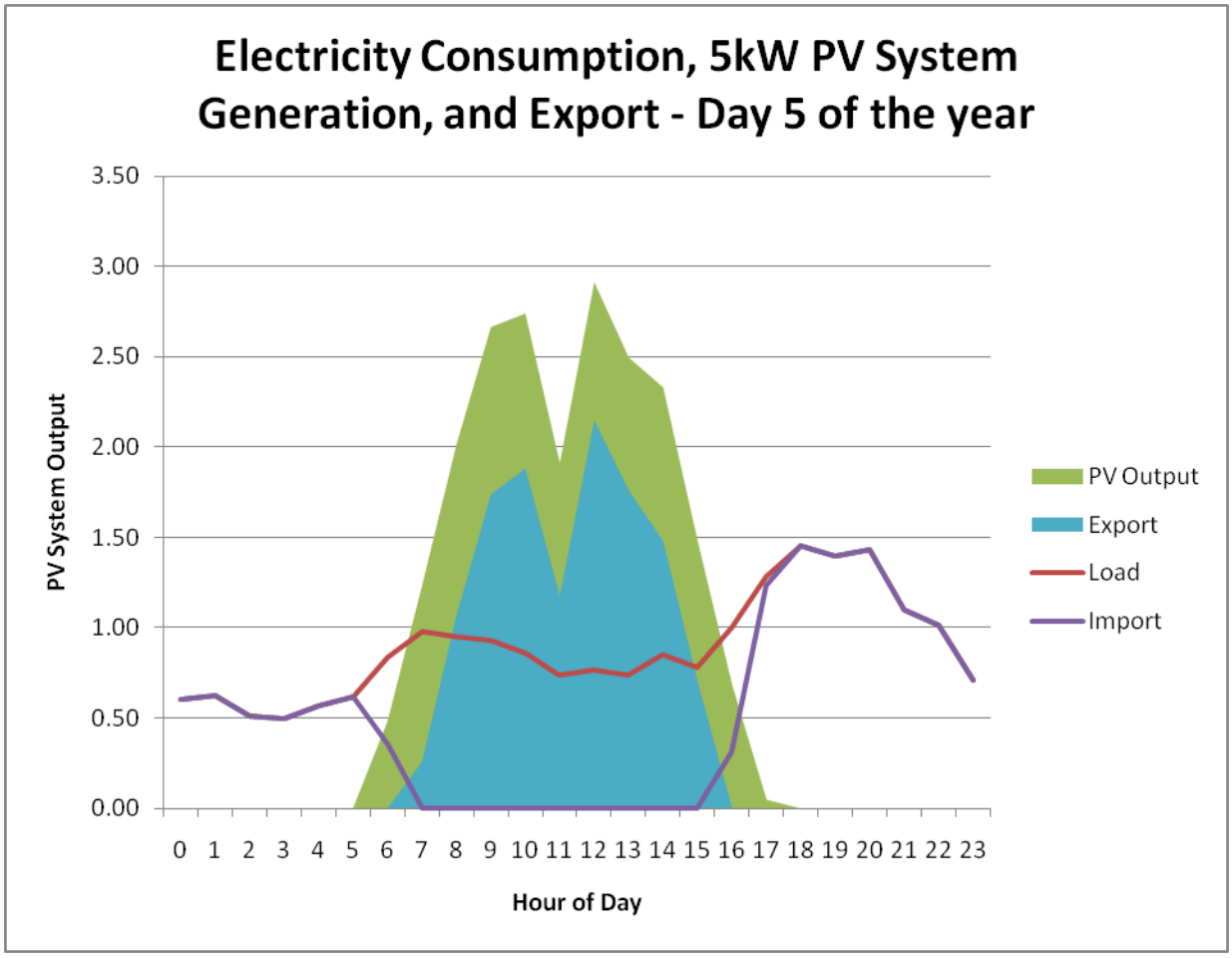
6.22.1 Description

This graph shows the (scaled) load profile used in the export calculation of the same name.

6.22.2 Sales Use

This graph can be used to illustrate the value of shifting power consumption to later periods in the day.

6.23 Net FiT Output Graph



6.23.1 Description

This graph shows the various categories of electricity flows in a net FiT based upon the entered load profile, and the chosen day of the year (cell B2). The output from solar power system results first in a reduction in import power, then the export of electricity to the grid.

6.23.2 Sales Use

This graph can be used to illustrate the value of shifting power consumption to later periods in the day.

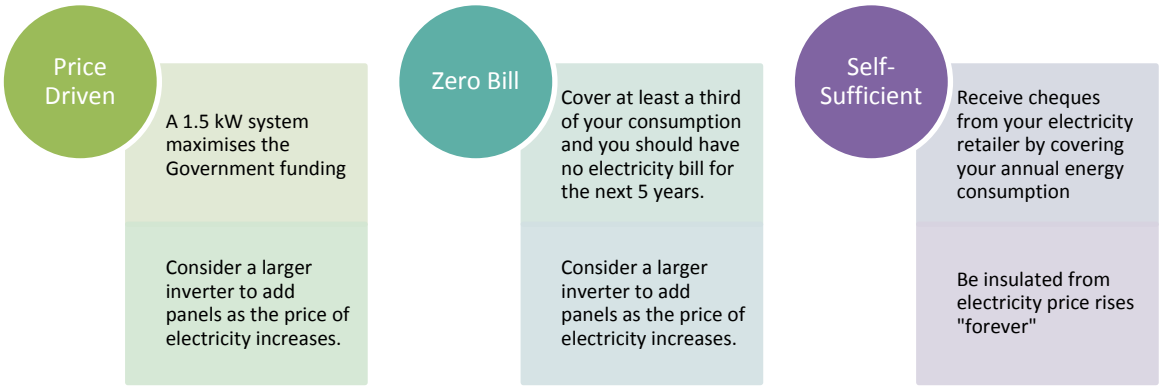
6.24 RECs Zone, Fits Exports

This tab provides internal calculations only.

7 A Final Thought

Selling is a subtle art. For many customers, complex graphs are likely to scare rather than convince. Consider creating simplified variants of these graphs that show one rising line or two lines – one rising and one falling. Alternatively, a bar chart can convey a similar message.

Sales messages should be targeted towards the customer's wants and needs. A customer that can only just afford a 1.5 kW system needs a different sales pitch to someone interested in maximising the value of their investment by purchasing 10 kW. Customers should always buy as large a system as they can afford, and upgrade their inverter if they want to expand in the next 3 years. Consider a three-pronged sales message:


Price Driven
A 1.5 kW system maximises the Government funding
Consider a larger inverter to add panels as the price of electricity increases.
Zero Bill
Cover at least a third of your consumption and you should have no electricity bill for the next 5 years.
Consider a larger inverter to add panels as the price of electricity increases.
Self-Sufficient
Receive cheques from your electricity retailer by covering your annual energy consumption
Be insulated from electricity price rises "forever"

7.1 SunWiz Services: Expert Solar Advice Can Help Your Business Shine!

- Need help putting a tender together?
- Need shading analysis performed?
- Need specialised solar engineering design?
- Need help with your website?
- Or simply don't have enough time to do everything to help your business grow?

SunWiz can help!

SunWiz is a specialist solar energy consultancy that can help your business grow.

SunWiz provides the following solar energy services:

Award-winning PV System Design	Tender Preparation	Procurement Advice
Independent Tender Evaluation	Business Opportunity Identification and Evaluation	System Performance Monitoring and Reporting
Technology Evaluation	Feasibility Studies	Installation training, supervision and sign-off

7.2 Export Calculation Products to Support Your Business

- Need assistance in convincing your customers to purchase from you?
- Sick of being undermined by your competitor's false claims?
- Want your customers to trust your performance and revenue calculations?
- SunWiz has the solution!

SunWiz, an independent solar power expert, is proud to endorse your performance estimates. What's more, SunWiz can provide your customers with an accurate revenue assessment, backed by measurements of solar performance and the best simulation software available. This can be quickly translated into likely revenue for the coming 20 years, as tailored to the tariffs that apply in your customer's state.

In addition to providing a quick turnaround on performance, revenue, and payback calculations for residential customers, SunWiz offers a Commercial Revenue Calculation service. Using the best solar simulation software available, SunWiz will perform an hour-by-hour calculation of your customer's revenue, based on their load and the solar radiation in that location.

7.3 The hardest part about selling COMMERCIAL solar power is now solved!

- Give your customers confidence
- Get your sales over the line
- Make promises you can keep
- Avoid litigation

Commercial solar power customers need evidence that their investment is wise. Installing a solar power system can improve businesses' environmental image, but most won't spend $10,000+ unless it's financially justifiable. Take that thumb out of the air - give them a true calculation of their solar revenue and their return on investment.

SunWiz takes your customer's electricity bills, synthesises 8700 hours of electricity consumption based on an agreed hourly load profile, and calculates revenue for each hour of the year, based on local solar radiation data. This answers the questions:

- How much energy will be exported?
- What will the revenue be?
- What will the payback be?
- What will the return on investment?
- What if a larger system is installed?
- What is the best orientation and inclination for maximum revenue?

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